THE AUTOMOBILE

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FINISH AND WINNERS OF THE HERKOMER

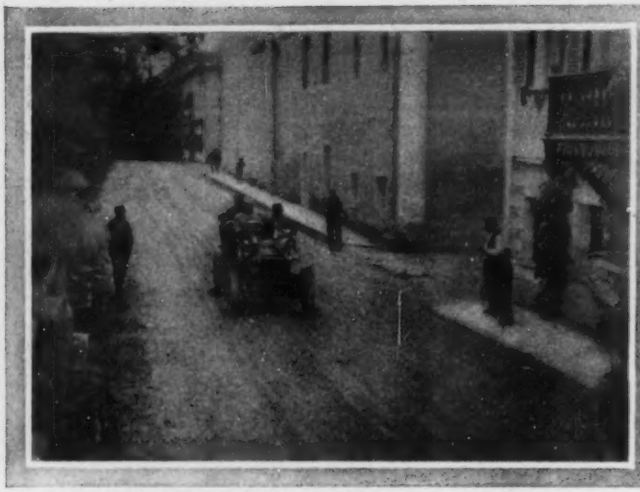
BY W. F. BRADLEY.

MUNICH, BAVARIA, June 14.—The Herkomer touring contest, which has just closed at Munich, after a distance of 1,000 miles, united no fewer than 133 starters, 90 of whom finished the tour. The first two stages of the tour were without important features, but as the cars advanced the roads became abominable and there was almost a competition among competitors anxious to apply to them appropriate adjectives. The first day's run, Frankfort to Munich, was over passable roads, and was covered in regulation time by nearly all the competitors. Only one accident occurred, a Benz machine turning turtle owing to taking a corner while running at too high a speed.

The 260 kilometers of the second stage, from Munich to Linz, brought the cars into romantically beautiful country, at one moment in deep valleys, at another climbing stiff hills with a muddy, greasy surface and a possibility of going into the ditch at any moment—an additional journey which not a few undertook. Racing tactics began at this early stage of the contest, though why drivers should have risked their machines and worn out their tires speeding in a contest taking no account of speed, it is difficult to understand.

From Linz to Vienna, 185 kilometers, the roads were in bad condition and a thick coating of mud adorned every car arriving

ROAD ON THE HERKOMER COURSE THAT CLIMBS THE SEMMERING HILL, IN BAVARIA.



DR. RUDOLPH STOESS, 20-H.P. HORCH, FIRST PRIZE WINNER.

RED CROSS AMBULANCE THAT ACCOMPANIED THE RUN.

at the Austrian capital. On this stage Prince Henry of Prussia acted as policeman, taking the middle of the road, traveling at regulation speed and refusing to move to one side for the passage of scorchers. Protests were lodged, but the prince was ruled to have acted wisely.

After an exhibition at Vienna in which 115 cars were shown, many of them not having a penalty point against them, a move was made for Klagenfurt, 308 kilometers away. Of the 113 cars which started 105 reached Klagenfurt, a 90-horsepower De Dietrich coming in first and a 60-horsepower Mercedes second. It was on this stage that the Semmering hill was climbed and the adjectives thrown at the road. The nine kilometer hill climb with a flying start was covered by most of the competitors, though a few came to grief on the bends and on the day's run a larger number lost points. There were still, however, 102 cars fit to leave Klagenfurt for Innsbruck, 331 kilometers, and with the exception of an Itala which went into a wall, a Benz which visited the ditch, a Metallurgique which cut down a tree, and a small number that found the road too much for them, all reached Innsbruck.

Here the last stage, a 140 kilometer run to Munich, began. Ninety-eight machines started and all but three finished, not a bad proportion over a road which included the Zirberg, 1,000 meters high with an average grade of 7 per cent. and an occasional 27. Low gears came into play everywhere, and when the descent was made into Bavaria, accompanied by heavy rain, the owners of anti-skids considered themselves fortunate individuals. When passing through the Forstenrieder Park a 5,000 meter speed test was held, the individual performance of which did not offer much interest, as the results were based on cylinder capacity, and included in the general classification. All the time the rain descended and accompanied the competitors into Munich, where a banquet and prize distribution brought the great German tour to an end.

MISS MAUDE MANVILLE, 35-45 H.P ENGLISH DAIMLER.

How the Prizes Were Awarded.

After much discussion, verification of cylinders and endless figuring, the jury has drawn up and made public the results of the touring contest for the Herkomer cup. To the surprise of all a low powered car has triumphed over the 40 and 60-horsepower monsters, the cup going to Rudolph Stoess with an 18-20-horsepower Horch machine fitted with Continental tires. The Horch car has been constructed in the recently opened workshops of Herr Horch, an engineer for a long time with the Benz firm, at Zwitzau, in Saxony. The complete list is as follows:

1. Rudolph Stoess, 18-20-h.p. Horch.
2. Emile Neumier, 40-h.p. Benz.
3. Willy Poege, 60-h.p. Mercedes.
4. Henrich Opel, 20-h.p. Opel Darracq.
5. Carl Neumier, 40-h.p. Benz.
6. Weingand, 70-h.p. Mercedes.
7. Hyeronimus, 90-h.p. Mercedes.
8. Ladenberg, 70-h.p. Mercedes.
9. Uren, 24-h.p. Metallurgique.
10. A. Horch, 40-h.p. Horch.
11. Grigg, 35-45-h.p. English Daimler.

The classification for the Semmering hill climb is:

1. Willy Poege, 60-h.p. Mercedes.
2. Emile Neumier, 40-h.p. Benz.
3. Carl Neumier, 40-h.p. Benz.
4. Hyeronimus, 90-h.p. Mercedes.

The speed test in the Forstenrieder Park gave the following results:

1. Rudolph Stoess, 18-20-h.p. Horch.
2. Carl Westphal, 16-18-h.p. German-Standard.
3. Betzen, 18-20-h.p. Horch.

The elegancy classification is as follows:

1. Eschebach (Benz).
2. Vandeslebin (Ader).
3. Haase (Adler).
4. Livingston (Adler).

Winners of Herkomer gold medal:

Percy Pierce (Pierce Arrow).
Miss Maud Manville (English Daimler).
Grigg (English Daimler).
Haase (Adler).
Roth (Benz).
Dohmen (Benz).
Flinsch (Mercedes).
Wild (Mercedes).
Dreher (Mercedes).
Juergens (Benz).
Frankenburg (S. A. G.).
Marchal (Renault).
Branda (Darracq).
Wilhelm (Opel-Darracq).
Turch (Benz).
Mathis (Fiat).
Uebel (Benz).
Kaldi (Benz).
Hesselberger (English Daimler).
Reinhardt (Metallurgique).
Lord Montagu (English Daimler).
Spitzner (De Dietrich).
Von Arco (Mercedes).
Baur (Diatto-Clément).
Vandesleben (Adler).
Weiss (Benz).
Commereli (Mercedes).
Prince Henry of Prussia (Benz).
Tischbein (Benz).
Beckmann (Darracq).
Wergel (Fiat).
Schoemperten (S. A. G.).
Sorel (De Dietrich).
Eschebach (Benz).
Milch (Fiat).
Braumbeck (Benz).
Von Tuede (Martini).
Haspacry (Mercedes).
Goldschmidt (Pipe).
Euler (Argus).
Mengers (Rekord).

COMBINATION TOUR TO MEET GLIDDENISTS.

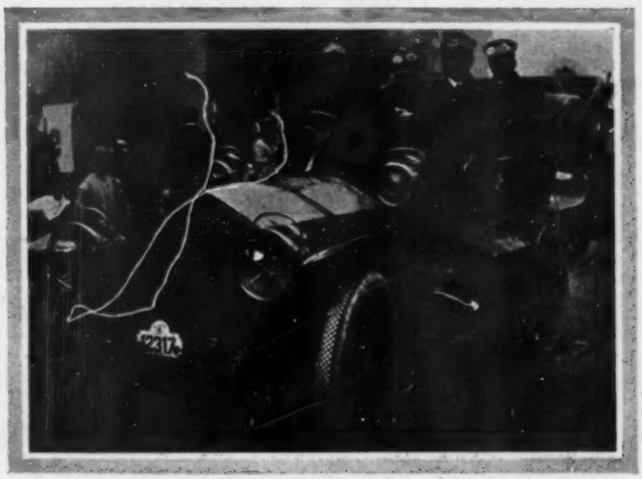
Gratified with the success of their recent three days' outing to Rye Beach, N. H., members of the Bay State Automobile Association, of Boston, are organizing another tour, on a more ambitious scale, to be carried out in connection with the finish of the Glidden tour and passing over the Rye Beach route. This will constitute the second annual tour of the Bay State Association. Leaving Boston on the morning of July 26, the tourists will journey to Rye Beach, where the Farragut House will be the stopping place for luncheon. Dinner will be taken at the Wentworth and the night will be spent there. On Friday, July 27, the run to Bretton Woods will be made so that the party will be on hand to greet the Glidden tourists when they arrive on the following day, Saturday.

Two days before the start of the Bostonians a large contingent of automobilists, organized by W. J. Morgan, will start from New York with the same destination in view. The night of July 24 will be spent at Hartford, Conn., and Boston will be reached next afternoon. After a night at the Somerset, where special arrangements will be made for the comfort of the travelers, the New York and Boston contingents will travel together to Bretton Woods via Rye Beach. From Boston on the tour will be under the management of the touring committee of the Bay State Automobile Association.

Saturday, Sunday, Monday and Tuesday, July 28, 29, 30 and 31, will be spent at Bretton Woods. Senator Morgan has arranged for a hill climb up Crawford Notch, to take place Monday and Tuesday. On Wednesday the trip will be resumed, Portland being the night stop for that day; and there the tourists will spend the following day, August 1. On Friday, August 3, the run to Boston will be made. The New York contingent will remain in Boston over night and take the road for home next morning, Saturday, August 4.

ALBANY A. C. ANNUAL TOUR.

BOSTON, June 25.—The members of the Albany Automobile Club, which is on its annual tour, reached Boston late Saturday afternoon and put up at their headquarters at the Hotel Thorndike. The club started from Albany Thursday morning in nineteen cars and the first day's run was to Rutland. Friday they continued through Vermont, traveling some very hilly and difficult roads, and reached Keene, N. H., the night stop that evening. Saturday morning an early start was made and the tourists traveled into Massachusetts, passing through Fitchburg and reaching historic Concord for luncheon. At that town they were met by members of the Bay State Automobile Association, who had been called together by President Speare on an impromptu run to welcome the visitors. The combined organizations came into Boston over the Paul Revere route during the afternoon.



DIRECTOR LEHMANN, A PROMINENT HERKOMER OFFICIAL.

The Albany tourists spent Sunday in this city and to-day started for home, stopping for the night at Springfield, and making the run to Albany through the Berkshires, Tuesday. Among those who are taking part in the run are A. J. McClure, Fiat; K. F. Robinson, Columbia; J. B. Kelley, Franklin; J. B. Taylor, Locomobile; J. P. Randerson, Pierce; B. W. Burdick, Peerless; E. W. Leahy, Locomobile; I. Newell, Peerless; H. M. Simmons, Franklin; W. F. Connors, Knox; W. G. Reynolds, Franklin; F. W. Cox, Cadillac; M. Van Alystine, Thomas; E. W. Battersham, Maxwell and H. Martin, Maxwell.

CHILDREN'S DAY IN BOSTON.

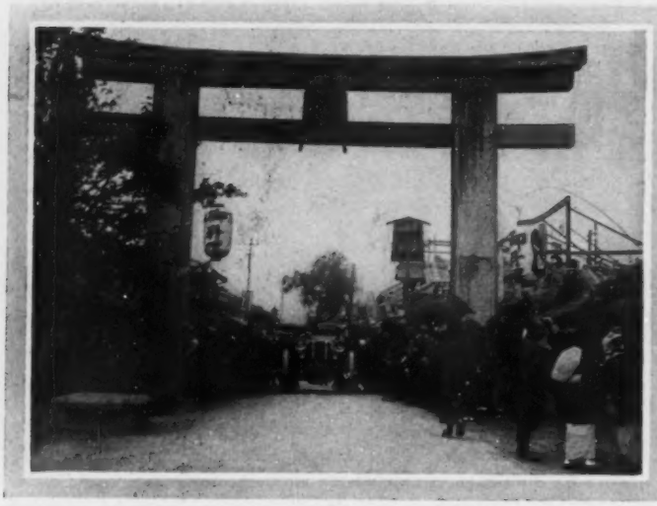
BOSTON, June 26.—To-day was the annual Children's Day of the Massachusetts Automobile Club. This day is very much like the Orphans' Days in other cities, only the club prefers to call it by a name of its own, because all the children who are taken on the outing are not orphans. Dr. W. S. Shrigley, of the club, had charge of the tour. About 200 children from three or four different institutions were taken for an outing to Hoosick-Whisick pond, a beautiful body of water in the Blue Hills park reservation, about ten miles from Boston, and the park commissioners co-operated in taking care of the children and giving them a good time. President Elliott C. Lee, of the club, acted as pacemaker for the run and no speeding was permitted. At the pond the children were given a luncheon and spent the rest of the time playing games and amusing themselves as they wished and as only children can.

TH. DREHER, A GOLD-MEDAL WINNER IN HIS MERCEDES.

HERKOMERITES JUST BEFORE LEAVING VIENNA.

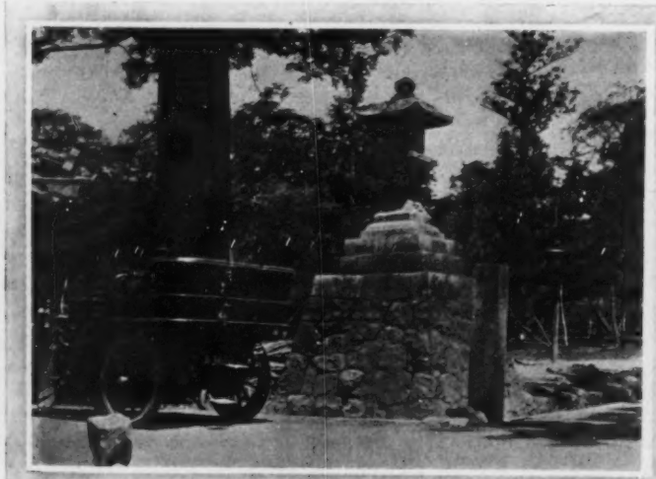
DOING JAPAN BY AUTOMOBILE.

By this week's mail from the land of cherry blossoms and chrysanthemums came the photographs of touring scenes in that far-off island empire, published on this page. They were forwarded by Charles J. Glidden, America's automobile globe girdler, and donor of the Glidden trophy, who sailed from Yokohama the early part of the present month and is due here about July 1. Since beginning the latest stage of the world tour, Mr. and Mrs. Glidden have traveled 8,500 miles in their Napier car. They left Bombay, India, December 1, and visited Ceylon, Cochin China and China, and finished the season with a 1,122 mile trip in Japan, bringing the total distance to date 33,600 miles. Mr. Glidden found the scenery delightful in Japan, but the roads disappointing, as they are narrow, and were built originally for jinrikishas, their surfaces being unsuited to the heavy touring car. Mr. Glidden will, of course, enter the Glidden tour, July 12-26.

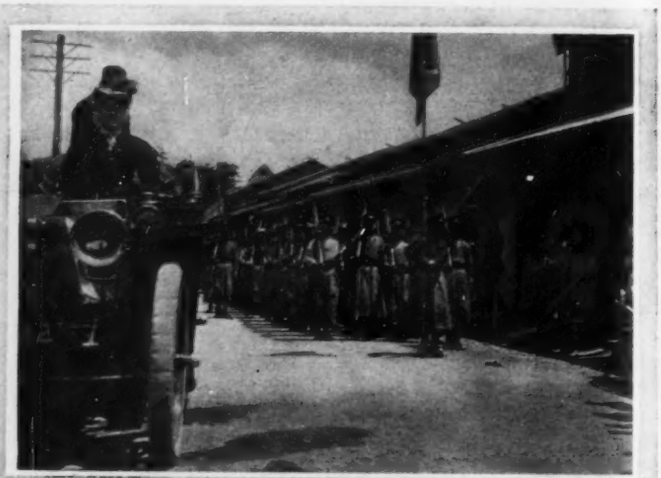


THE MASSIVE ROYUBA GATEWAY.

A TYPICAL JAPANESE HOMESTEAD.



JAPANESE STONE LANTERN BY THE ROAD.



DRILLING "THE BOYS" FOR THE WAR OF 19—?

VILLAGE STREET IN THE JAPANESE PROVINCES.

A THIRTY PER CENT GRADE WITH V CURVES IN JAPAN.

MATERIALS FOR AUTOMOBILE CONSTRUCTION*

By THOS. J. FAY, E.E.

A general in the field in considering how best to advance his forces against the opposition of a vigorous enemy, must, to win, take into account the facilities at his disposal; and, too, we may say, motor car engineers, to be successful, can scarcely afford to overlook at least three factors, viz:

(*a*) The requirements in view of the services to be rendered.

(*b*) The normal facilities.

(*c*) The relation between the normal facilities and the requirements. In other words:

$C=1\frac{a}{b}-1=0$ if Mr. Engineer is to have no pioneer work to do.

That the motor car problem is anything but a zero equation is as plain as can be, nor may we be sure of either "a" or "b" of the equation as available assets in the column of known values.

In an *academic* way, to solve this problem is too simple to require any further elucidation, but in a motor car we must apply the solution, and, as one might readily appreciate, a very few "thank-you-marms" are enough to spill the academic solution in nearly every case.

If the wants of the dilemma are uncertain, and the facilities afforded are scant, naturally enough the results obtainable will also inhabit the land of uncertainty, as it were.

The situation may be, and probably is, further complicated, since in all sincerity the normal facilities are inadequate to cope with what might be called the abnormal demand.

In other words, *we want better materials than we are able to secure*, and what is more to the point, we want the better materials quicker than we can now secure the products that do obtain upon the market.

Where we are now able to secure inferior grades of Bessemer steel drop forgings in, say, four to eight months, we want nickel chrome-steel drop forgings in from four to eight weeks. Will we realize our wants? I predict, gentlemen, we surely will! for reasons quite as irresistible as a "Kansas cyclone."

In the first place, our wants are real, and, again, we can afford to pay for what we want because necessity from every point of view dictates our choice.

Drop Forging Requirements.

I mention drop forgings merely as an incident, for in all truth it is as difficult to procure other genera of material as it is to obtain drop forgings. Before we can figure upon quick deliveries, or, for that matter, slow deliveries of materials, a decision must be rendered settling the question of the requirements, a decision indeed likely to afford much room for reflection ere a conservative settlement of the question can be arrived at.

There are two classes of engineers to be taken into account in a matter of this sort, *i.e.*, the "dog in the manger" class, promulgating methods for rendering it unprofitable for any one using materials of a quality superior to those used by themselves, and the class of engineers who stand for quality without respect to first cost, if the end just offers the means.

It is to the efforts of the latter class of engineers that we must look for advancement, and it is to them the purchaser of motor cars will turn in the future when in quest of quality.

Some two or three years ago, or maybe longer, when it dawned upon the minds of men that American roads and a display of ginger inherent in American motorists were a combination too strenuous by far for common metal to withstand, the canvass for better material started with a vim and a vividness marvelously gaining in headway ever since, until to-day, as we may say, half the mills in America are running overtime on motor car products, and the other half are awakening—like Rip Van Winkle after his long sleep—to what is to them a startling condition, for when a motor car builder says he wants nickel chrome-steel for his crankshafts, he knows what he wants, and knows enough not to accept a cheaper substitute.

At first when the matter was broached to the mills, they laughed!—'twas a sardonic sidelong knowing grin—and they missed the matter with the further brief statement, *"Freak steel is not profitable to produce."*

Krupp, Schneider, Bischoff, Palidi, Lemoine, and other foreign steelmongers believed it was profitable, and for a considerable time they maintained a practical monopoly as a result of their belief.

Varieties of American Alloy Steel.

In America, while alloy steel was a known quantity, its uses were few, excepting for guns, armor plate, and projectiles; nor was it supposed any one who could use carbon steel would employ the high grades of alloy steel at prices ranging from five to ten times more than the prevailing market for carbon steel products.

They overlooked a circumstance, for the material represents but a small fraction of the total cost. Moreover, if a task when performed will not stay done, it is a most annoying matter. If a car sells for, say, a dollar a pound, it may not be far from right to represent the material in the raw state as affording may be 12½ per cent. of the total selling price.

It matters not at all just what the material may cost, provided it is the quality of the material necessary for the purpose, and no cheaper grade of material will suffice.

As to what will suffice for a purpose, enough is to say the purchasers are the dictators. In other words, the moment some one fixes a higher level than the plane previously afforded, it is at that moment purchasers advance their standard, and clamor for what they want; in fact, what is reasonable for any one to demand, *i.e.*, "the best that money can buy."

It would be nonsensical in the extreme to adopt any high-priced alloy steel product in motor car work if the strength and security resulting from what is known as machine steel are all the situation warrants.

The highest-priced material is oftentimes more inappropriate than the very cheapest product to be had, as, for illustration, a tool steel wrist pin at 80 cents per pound is as irresponsible as a "coon in a hennery," whereas, ordinary Bessemer steel, properly treated, might outlive the rest of the motor. In other words, the 80-cent steel is of no value at all in such a place, whereas the 2-cent steel would probably serve for a considerable period.

The right material, then, for the respective parts must be our persistent aim to secure, and it is believed the material should be the most readily obtainable and the lowest-priced product possible to employ with absolute safety.

No man is justified in attempting to deceive the purchasers of his product on any pretext whatsoever. Whereas, a man who tries to deceive himself can scarcely expect to reach heaven and not have a burnt odor about his person.

Material for Crankshafts.

It is deception pure and simple to use, say, nickel chrome-steel for crankshafts and cast bronze for axles. It is equally a deception to employ mild steel for crankshafts. The only question is, Does the engineer who adopts such material for such a place know it is not suitable? 'Tis hoped not.

It is not the purpose here to attempt to say what should be the qualities of the materials for the respective parts of motor cars. Moreover, it is a problem yet to be satisfactorily solved.

True, a car constructed wholly of nickel chrome-steel, for instance, would be unbreakable, but for many of the parts in the

*From a paper read before the Society of Automobile Engineers in New York.

make-up of the car it would be as "pearls to the swine." However, the tendency in the past has not made it possible for swine to bedeck themselves with pearls.

The exact qualifications of nickel chrome-steel for motor car work are diverse. In the first instance, nickel chrome-steel possesses all the advantages of nickel-steel, with none of the treacherous characteristics of the latter. And, again, nickel chrome-steel will afford any degree of tensile strength, from 80,000 to 250,000 pounds per square inch, with an elastic limit of from 80 to 90 per cent. of the tensile strength—one of the marked characteristics of the metal— and an elongation ranging between a maximum of 30 per cent. and a minumum of about 5 per cent., and using suitable grades of this remarkable product, all of these qualifications may be afforded from one single bar of steel, not at the hands of an expert of long training, but under the guidance of a man of ordinary talents if he will but carry out the methods known to effect these ends.

Use of Nickel Chrome-Steel.

Stress has been laid upon the use of nickel chrome-steel, not because it is without any doubt the very best genera of steel, but because it possesses positively good qualities, and may be had upon the market.

There are other grades of steel besides, but they are not so well known and are much more difficult to procure. Nevertheless, the qualities of some of the other genera of steel are very interesting indeed.

The influence of composition on steel is now receiving a great deal of attention at the hands of the steel men, and strange as it may seem, some of the old doctrines are in the "scrap heap."

Motor car engineers have proven themselves to be a persistent lot, and have gone right ahead demanding results whenever and wherever the occasion demanded.

As soon as it was discovered that a projectile would withstand shock stresses, the question of the composition of the same was quickly ascertained by motor car engineers, for to them the question of shock stresses is the one great problem.

It was found that chromium made up a large part of the desirable qualities in "projectiles," and that nickel steel alone as an "intensifier" would not suffice.

Chromium from 1-2 to 2 1-2 per cent. may be used in steel in conjunction with nickel or otherwise, and as an intensifier chromium ranks carbon, and besides hardening as does carbon, chromium prevents the crystalline formation so detrimental to strength and pliability.

Chromium is better in all probability than vanadium for these purposes, but there seems to be no impropriety in the use of both chromium and vanadium, with or without nickel.

Nickel, as is well known, possesses valuable properties, such as resisting the propagation of cracks. Nickel also tends to widen the range of shock-resisting qualities, but whatever nickel does to steel chromium does better, provided nickel remains as a component.

Vanadium may be extremely valuable in metal for motor cars, on account of its especial quality of increasing the ability of steel to resist fatigue.

What we are all afraid of is the future of the car, that is to say, we know a car will run for a month, or even a season, but will the continual shock and jar result ultimately in "metal fatigue"?

We know fatigue is bound to set in, in time, and to defer the evil day efforts are put forth to so compose the steel as to make it especially able to resist fatigue.

Vanadium, then, is a very important element, because it does give to steel further ability to resist fatigue, but it is not necessary to eliminate either nickel or chromium to use vanadium.

Components of Ordinary Steel.

In ordinary steel the components present are silicon, sulphur, phosphorus, and manganese, aside from iron.

The aim with steel is not to entirely eliminate these products, but to so adjust the respective quantities present as to effect the best results, as for illustration: For a given adjustment of the manganese, the silicon component should be fixed to neutralize the ills of manganese.

Without taking time to more than mention the presence of these components—for their qualities are generally well appreciated—we may pass on to the further discussion of the influences of these components upon chromium, vanadium and other "intensifiers."

It has been found that a fine low phosphorous product with a nice adjustment of silicon and manganese, paying due respect to sulphur—which makes steel hot short—results in a product of great value by adding but a small amount of chromium and about 2 per cent. of nickel.

A metal of this sort is easily worked, not difficult to produce, and performs in service extremely well. There are foreign cars that have made a fine record for themselves that have not one single pound of what might be called standard nickel chrome-steel in their makeup, but these cars have nickel chrome-steel that is vastly superior to any purely nickel steel possible to produce.

Drop forgings of this low chrome product are easy to make and would answer all practical requirements, besides eliminating the chances of trouble likely to follow the use of ordinary carbon steel drop forgings for many important purposes.

It is not impossible, however, to procure drop forgings of medium chrome nickel steel, nor would it be desirable to substitute the low chrome variety in the important cases requiring great strength.

One guarantee purchasers of motor cars will have with the use of alloy steel of either the nickel chrome or some of the other genera, *is the entire absence of weld*, for to weld these products is, to say the least, *a very difficult feat*, although "Krupp" says 'tis not feasible.

Molybdenum and tungsten do not seem to be of more than nominal value as intensifiers in motor car metal, particularly molybdenum.

The use of these products in conjunction with chromium might be something to consider, but in the main, these components belong to the tool steel series, whereas nickel chrome-steel, as it is used in motor car practice, is not even a member of the tool steel family.

Practical Situation Complicated.

The practical situation is rather complicated when reference is had to alloy steel products, or, for the matter of that, all steel products, owing to a mass of fallacies set forth as presenting facts.

With so many components it is extremely difficult for even experts to arrive at correct conclusions, and again the "commercial" equation is a devilish imp to down.

To illustrate the situation more clearly it is to point out the versatility of good steel as against the lack of the same qualities in inferior products, yet, even so, the inferoir product will show up with the luster of a bogus five-cent piece and the nerve of a brigand, in contrast with the modest mien of quality.

In so far as the steel vendors are concerned, they all claim to have a monopoly of quality, and they all employ every influence under the sun to land their products.

It is entirely up to the "automobile engineer," who must judge for himself, act on his own initiative, and in spite of every adverse influence employ the most appropriate products of all lands.

In the process of working alloy steel products, there are many things to consider, and it is in this zone of activity that the most trouble will be experienced ere alloy steel products will find their way as welcome lodgers in the storeroom of shops in general.

It will not be possible to discuss this phase of the situation at this time more than to say 'tis easy enough to work alloy steel products under certain conditions.

The cost of a car made of alloy steel would be very high in such a shop, whereas, in fact, the cost of a car with all important parts of nickel chrome-steel need not be prohibitive if only the steel is properly worked.

ESSENTIAL POINTS OF THE NEW JERSEY LAW

NUMBERS of automobilists are in the habit of indulging in their favorite sport on the fine roads of New Jersey, not only residents of the state, but automobilists from the neighboring states. The beautiful and varied scenery, the general excellence of the roads and the numerous spots of interest make many parts of New Jersey particularly suitable for day runs and short tours; but those whose journeys lead them into the mosquito state will do well to make themselves familiar with the provisions of the new automobile law which goes into effect on July 1. From many inquiries received it would appear that automobilists are not, as a rule, cognizant of the restrictions imposed by the Frelinghuysen measure, and the following excerpts will doubtless assist tourists in keeping on the right side of the law.

No changes have been made in the matter of fees. Cars up to 30 horsepower will be charged $4 a year, $3 for registration and $1 for license to drive. If the horsepower is more than 30, the charge will be $7, $5 being for registration and $2 for license to drive. Motorcycles will be charged $1, and are not required to carry license tags, though cars must have four-inch numbers at front and rear. The age of drivers must be not less than sixteen years, two years younger than permitted by the old law.

A point that calls for special attention is that no licenses or registrations under the old law will be valid after the new law takes effect on July 1 next. It will cost the automobilist $100 to use an old license after that date.

Construction and Equipment of Motor Vehicles.

3. Every motor vehicle must be equipped with a plainly audible signal trumpet. Penalty, fine $10.

4. (1) Every automobile shall carry, during the period from one hour after sunset to one hour before sunrise, and whenever fog renders it impossible to see a long distance, at least two lighted lamps, showing white lights, visible at least two hundred and fifty feet in the direcelon toward which said automobile is proceeding, and shall also exhibit one red light visible in the reverse direction. Upon the fronts of the two aforesaid lamps showing white lights shall be displayed, in such a manner as to be plainly visible when such lamps are lighted, the number of the registration certificate issued as in this act provided, the same to be in Arabic numerals, not less than one inch in height. Penalty, fine $10.

Restrictions on the Use of Tire Chains.

6. No motor vehicle shall be fitted with a chain when used upon gravel, macadam or other made roads, except upon natural dirt, asphalt, cobble, Belgian block, or vitrified brick pavements; provided, however, that tires may be fitted with a chain when used upon roads covered with a coating of at least one inch of snow or ice. Penalty, fine $50.

7. Every motor vehicle must have devices to prevent excessive noise, annoying smoke and the escape of gas and steam, as well as the falling out of embers or residue from the fuel.

Motor Vehicle Registration and Regulation.

The fee allowed each agent for registration certificates so issued by him, and for every license so granted by him, shall be fixed by the inspector of motor vehicles, the same to be retained from the registration fee or the license fee paid to him; provided, however, that every registration and registration certificate and every license to drive motor vehicles may be revoked by the said commissioner of motor vehicles for a violation of any of the provisions of this act or on other reasonable grounds, after due notice in writing of such proposed revocation and the ground thereof, and if a driver of motor vehicles shall have had his license revoked, a new license granted to him within one year thereafter shall be void and of no effect unless it shall be granted by the said commissioner of motor vehicles in person; and if the registration or registration certificate of any motor vehicle shall have been revoked, a new registration made, or new registration certificate issued within one year thereafter shall be void and of no effect unless the new registration shall be made and the new certificate issued under the personal direction of the commissioner of motor vehicles.

The Operation of Motor Vehicles.

15. No person shall drive a motor vehicle, the owner of which vehicle shall not have complied with the provisions of this act concerning the proper registration and identification of the same (Penalty, $100); nor shall any person drive a motor vehicle which shall display on the front or back thereof a fictitious number or a number other than that designated for such motor vehicle in the New Jersey registration certificate of such motor vehicle. Penalty, fine $500 or imprisonment for sixty days.

16. (1) Every resident of this state who is the owner of an automobile, and every non-resident owner whose automobile shall be driven in this state, shall annually file in the office of the commissioner of motor vehicles, or with the lawful agent of said commissioner, a statement in writing, containing the name and address of such owner, together with a brief description of the character of such automobile, including the name of the maker and the manufacturer's number of the automobile, if number there be, and the real horsepower of the automobile, and shall pay annually to the commissioner of motor vehicles, or his lawful agent, a registration fee of $2 for each motor vehicle having a rating of less than 30 horsepower, and $5 for each motor vehicle having a rating of 30 horsepower or more; and if an automobile has two ratings of horsepower the registration fee shall be based upon the highest rating. The commissioner of motor vehicles shall issue for each automobile so registered a certificate properly numbered, stating that such automobile is registered in accordance with this section, and shall cause the name of such owner, with his address, the number of his certificate, and the description of such automobile or automobiles, to be entered in alphabetical order of the owners' names in a book to be kept for that purpose; provided, however, that the commissioner of motor vehicles may refuse registration in the case of any automobile that shall not comply with the requirements of this act or that shall seem to him unsuitable for use on the public roads and highways of this state. Each owner having a residence outside of the state shall file with the secretary of state a duly executed instrument, constituting the secretary of state and his successors in office the true and lawful attorney upon whom all original process in any action or legal proceeding for damages, caused by the operation of his registered motor vehicle within this state, against such owner may be served, and therein shall agree that any original process against such owner shall be of the same force and effect as if served on such owner within this state; the service of such process shall be made by leaving a copy of the same in the office of the secretary of state with a service fee of $2 to be taxed on the plaintiff's cost of suit. Said commissioner of motor vehicles shall forthwith notify such owner of such service by letter directed to him addressed at the post-office address stated in his application. Upon any and every transfer of a registered automobile by the owner thereof, in whose name the same is registered, the said registration and certificate thereof shall forthwith be and become void; but the same may be validated by the indorsement of the commissioner of motor vehicles, the purchaser having made written application therefor and paid a transfer fee of $1. Every registration shall expire and the certificate thereof become void at the expiration of one year from the date thereof, subject to renewal by the commissioner of motor vehicles upon the filing of the proper statement and the payment of the registration fee by the owner of the automobile.

Provisions Affecting Automobile Dealers.

(3) Every manufacturer of or dealer in automobiles, instead of registering each automobile owned or controlled by him, may make application, as hereinbefore provided in this section, for a registration number, and the written statement, in addition to the matters hereinbefore contained, shall state that he is a manufacturer or dealer, as the case may be, and that he desires to use a single number for all automobiles owned or controlled by him; and thereupon the commissioner of motor vehicles, if satisfied of the facts stated in said application, shall issue a certificate, as hereinbefore set forth, assigning the same a number as hereinbefore set forth, which certificate shall contain the statement that the same is issued to the applicant as a manufacturer or dealer, as the case may be, and that one certificate shall cover and be valid for all automobiles owned or controlled by such manufacturer or dealer until sold or let for hire, or loaned for a period of not more than five successive days. All such automobiles shall be regarded as registered under such general number; provided, and if, in addition to the registration number displayed on the front and back of the car, as hereinafter provided, there shall be added the letter "M," of equal size and prominence; and provided, further, that not more than five automobiles, owned or controlled by the same manufacturer of or dealer in automobiles, shall be in operation at the same time under the same number. The fee for every such manufacturer's or dealer's certificate shall be $20.

Old Licenses Invalid After July 1.

(4) No registration or registration certificate made or issued under any former act shall be valid after July 1, 1906. Penalty, $100.

17. No person shall hereafter drive an automobile upon any public street, public road, or turnpike, public park or parkway, or public driveway or public highway in this state unless licensed to do so in accordance with the provisions of this act. Penalty, $500 fine or imprisonment sixty days. No person under the age of sixteen years shall be licensed to drive automobiles, nor shall any person be licensed to drive automobiles until said person shall have passed a satisfactory examination as to his ability as an operator, which examination shall include a test of the knowledge on the part of said person of such portions of the mechanism of automobiles as is necessary in order to insure the safe operation of a vehicle of the kind or kinds indicated by the applicant. Licenses and the fees therefor shall be rated according to the horsepower of automobiles and shall be granted for the period of one year; and the license, for one year from the date thereof, shall entitle the licensee to drive any registered automobile of the class for which it is granted, or of a class of a smaller horsepower. Automobiles of a horsepower not exceeding one horsepower shall be rated Class 1, and in like manner the class of every automobile shall be determined by the number of horsepower of the vehicle, and the annual fee for a license to drive any automobile of a rating less than 30 horsepower shall be $1, and to drive any automobile having a rating of 30 horsepower or more, shall be $2, and if an automobile shall have two ratings of horsepower, the license fee shall be based upon the higher rating.

Learning to Operate an Automobile Under the New Law.

When an automobile driver, upon passing a satisfactory examination, shall have been once granted a license hereunder, no further examinations shall be required for a renewal of the said license, unless the commissioner of automobiles shall deem it necessary;

provided, however, it shall be lawful for the commissioner of motor vehicles at his discretion to issue to any person a written permit, under the hand and seal of said commissioner, allowing the said person, for the purpose of fitting himself to become a motor vehicle driver, to operate a motor vehicle for a specified period of not more than three weeks, while in company and under the supervision of a licensed motor vehicle driver; and such permit, under the hand and seal of the commissioner of motor vehicles, shall be sufficient license for the said person to operate a motor vehicle in this state during the period specified, while in the company of and under the control of a licensed motor vehicle driver of this state; and provided further, that the said person, as well as such licensed motor vehicle driver, shall be held accountable for all violations of this act committed by the said person while in the presence of such licensed motor vehicle driver.

Must Show Licenses at Request of Police.

18. Each license to drive an automobile shall specify the maximum horsepower of the automobile allowed to be driven thereunder, and shall have indorsed thereon in the proper handwriting of the licensee the name of the licensee; and said licensee when thereupon requested by any motor vehicle inspector or magistrate while in the performance of the duties of his office under this act, shall exhibit said license to said officer and write his name in the presence of said officer to the end that he may thereby determine the identity of said licensee. Penalty, fine $10.

20. No person shall drive a motor vehicle without the consent of the owner. Penalty, fine $500 or imprisonment sixty days.

Identification Marks of Motor Vehicles.

21. The owner of each and every automobile which shall be driven upon the public streets, public roads, turnpikes, parks, public parkways, public driveways or public highways in this state shall have the number of the registration certificate, issued as in this act provided, upon both the front and back of every automobile, stationary, in a conspicuous place, at least fifteen inches and not more than thirty-six inches above the level of the ground, kept clear and distinct and clear of grease, dust or other blurring matter, so as to be plainly visible at all times during daylight; such numbers to be separate Arabic numerals and not less than four inches in height, the strokes to be in width not less than one-half an inch; and there shall not be placed upon the front or rear of said vehicle any other numbers; and when the number of the registration certificate shall include a letter or letters, such letter or letters are to be not less than four inches in height and the strokes to be not less than one-half of an inch in width. Penalty, fine $100.

Use of Roads and Highways by Automobiles.

22. (1) Drivers of motor vehicles, whether of burthen or pleasure, using any of the turnpikes or public roads in this state, when met by another motor vehicle, or by a carriage, sleigh, or sled, shall keep to the right, and when overtaken by another motor vehicle, carriage, sleigh or sled, they shall likewise keep to the right, so as in both cases to permit such motor vehicle, carriage, sleigh or sled, either met or overtaken, to pass uninterrupted. Penalty, fine, $25.

(3) No person shall drive a motor vehicle upon any public street, public highway, public road, public parkway, turnpike or public driveway in this state in a race or on a bet or wager. Penalty, $100 and license revoked.

Regulations Governing Speed in New Jersey.

(1) A speed of one mile in seven minutes upon the sharp curves of a street or highway, or when turning a corner, and a speed of one mile in four minutes at the junction or intersection of a prominent cross-road where such a street, road or highway passes through the open country. The term "open country" meaning where houses are an average more than one hundred feet apart.

(2) A speed of one mile in five minutes where such street or highway passes through the built-up portion of a city, town, township, borough or village where the houses are an average less than one hundred feet apart.

(3) A speed of one mile in four minutes within two hundred feet of any horse or other beast of draught or burden upon the same street or highway, provided, however, that such speed not exceeding twenty miles per hour, shall be lawful in the open country, as may be necessary in order to pass a vehicle traveling in the same direction, but the speed shall be diminished forthwith if necessary to comply with the provisions of this act.

(4) Elsewhere and except as otherwise provided in subdivisions one, two and three of this section a speed of one mile in three minutes, etc.

Consequences of Violations of the New Law.

(2) Any person arrested for a violation of the provisions of this act shall, upon demand for the magistrate hearing the complaint against said person, produce his license for inspection, and if said person shall fail to produce his license, or to give a satisfactory excuse for its non-introduction, he shall, in addition to any other penalties imposed by said magistrate, be subject to a fine of not more than twenty-five dollars.

35. Any person who shall be convicted of violating the provisions of this act shall be subject to a fine not exceeding one hundred dollars; in default of the payment of such fine there shall be imposed an imprisonment in the county jail for a period not exceeding ten days; provided, that any offender who shall be convicted of a second offense of the same violation may be fined in double the amount herein prescribed for the first offense, and may, in default of the payment thereof, be punished by imprisonment in the county jail for a period not exceeding twenty days; provided further, that the penalties above prescribed shall not apply to the display of a fictitious number.

Any person convicted of displaying a fictitious number, as prohibited by section fifteen, or of violating the provisions of sections seventeen, nineteen and twenty of this act, shall be subject to a fine not exceeding five hundred dollars, or to imprisonment in the county jail for a period not exceeding sixty days.

The city council of St. Paul, Minn., recently passed a resolution instructing the city engineer to raise the crosswalks two inches on certain streets to prevent fast automobiling.

TIRE TREADS RATED AS SOFT RUBBER.

WASHINGTON, D. C., June 25.—The Treasury Department has promulgated a decision of the Board of General Appraisers, wherein it was held that automobile tire treads are subject to duty at the rate of 30 per cent. *ad valorem* under the provisions of paragraph 449, of the tariff act of 1897. The appraiser returned the merchandise as vulcanized India rubber, and the collector of customs at New York assessed duty at the rate of 35 per cent. *ad valorem* under the provisions of paragraph 450 of the same act. The former paragraph provides for manufactures of India rubber, while paragraph 450 provides for manufactures of "vulcanized India rubber, known as 'hard rubber.'" The board held that it was not important to the determination of the issue that the rubber in question was only semivulcanized, as the board thought any process of vulcanization would be sufficient to take the product thereof out of paragraph 449, if the result thereof was hard rubber, but since, as in this case, the product is soft rubber, it seemed clear that the protesting importers had the best of the argument, and the board therefore sustained the protests and reversed the decisions of the collector. Reliquidations followed accordingly.

DULL TIMES IN FAR-FAMED LEICESTER.

The selectmen of Leicester, Mass., are having dull times this season as far as automobilists are concerned. Their coffers apparently are not as full as when Chief Quinn was really onto his job last season. The selectmen are now beginning to advertise under big headlines the following:

At a meeting of the selectmen June 12th it was voted:

That reckless driving or excessive speeding was not to be allowed in the town during 1906.

That we feel as liberally towards automobilists, as we tried to be last year in then raising the speed limit from 8 to 15 miles, and again raise the limit to 20 miles an hour for this year, with the exception of intersecting streets and curves, as provided for by state law.

That so long as a spirit of fairness is shown we shall meet them in the same spirit, but the laws must be respected.

TESTING VALIDITY OF ROAD LAW IN VERMONT.

MIDDLEBURY, VT., June 25.—The American Motor League has decided to test the validity of the action of the selectmen of Middlebury in posting the road from Rogers Corners to the Ripton line, against automobiles. F. R. Dickerman, of Bristol, a member of the league, accompanied by its attorney, W. H. Davis, of this place, made a trip over the forbidden road in an automobile. Before starting out the selectmen of Middlebury were notified that the trip would be made for the purpose of inducing the bringing of a test case, and that Mr. Dickerman would hold himself in readiness to respond to any action the town might take.

The American Motor League takes the position that the town having taken this action should either defend its position or recede from it, and that unless the town has a right to close this road, persons desiring to use automobiles upon it should not be intimidated by the posting of an illegal notice.

DRIP PANS IN PHILADELPHIA.

PHILADELPHIA, June 25.—On Saturday last Mayor Weaver attached his signature to the ordinance requiring all automobiles operated within the city limits to be equipped with drip pans, and also to that prohibiting the sounding of siren or Gabriel horns on the city streets. The ordinance repealing the local automobile law, which was introduced by request of the local automobile club officials, was pigeonholed in committee and will go over till next session of councils. There is no telling what its ultimate fate will be.

FRENCH INDUSTRIAL VEHICLE COMPETITION

By W. P. BRADLEY.

PARIS, June 12.—A demonstration of commercial vehicles over a route from Paris through the important industrial centers to Tourcoing has been conducted in connection with the international exposition at Tourcoing by the Automobile Club of the North of France. Although spoken of as a competition, the event is more fittingly described as a demonstration, for the twenty-five vehicles engaged were divided into so many classes and were so dissimilar in construction that it is difficult to tabulate or compare their performances. The promoters, indeed, desire nothing more than to draw the attention of the industrial north to the value of mechanical transport and to give manufacturers an opportunity of watching commercial vehicles in action. In general the competition was similar to the one held by the Automobile Club of France last summer which resulted in the placing of many orders with the competing firms from both France and abroad.

The scene of the departure was at the Tuileries Gardens, as last year, and the country traversed was practically the same.

In the first class or division, for passenger vehicles carrying from twelve to twenty-four persons, there were two cars, a Delahaye 'bus and a handsome Bayard-Clément with open berline body, each weighing about 3 1-4 tons with full tanks. There were also two vehicles in the class for omnibuses carrying more than thirty passengers, one being the 32-40-horsepower Eugene Brillie similar to those adopted by the General Omnibus Company, and just put in service on the streets of Paris. This car, which can be run on either gasoline or alcohol, used the latter fuel. Its companion was one of the big Bayard-Clément cars with rear entrance body which the firm has but recently specialized.

The transport carrying classes commenced with tri-carriers carrying not less than 110 pounds load. There were six competitors, three Austral and three Contal vehicles. Both are single-cylinder, water-cooled machines with single chain drive, the Austral being run on gasoline and the Contal on alcohol.

Delivery vans carrying a load of from one to two tons were represented by a front-drive Latil, a Bayard-Clément and a Peugeot. All had two-cylinder motors and employed gasoline as fuel. The Latil car, a familiar figure in these competitions, carries its motor forward and drives through the front wheels. The Bayard-Clément drives through a propeller shaft to a live axle, and the Peugeot has side chains.

The class for vehicles carrying from two to three and a half tons embraced six competitors: an Auto-Camion, a front-driven Latil, a Louet & Badin, an Aries, an Achard (D'Espine Achard & Co.) and a Brillie. The Eugene Brillie and the Auto-Camion employed alcohol as fuel, all the others using gasoline.

The class for vehicles carrying three and a half tons had five starters, all with bodies especially constructed for some particular class of merchandise. A Eugene Brillie and a V. Janvier were run on alcohol; a Latil, a Prunel and a Peugeot used gasoline.

The Mors 'bus was given a class to itself, owing to its heavy body. The chassis was a 28-horsepower four-cylinder, with chain drive, the body being especially built for the Maggi Milk Company. It consisted of three separate compartments, two being entered by side doors and one by the rear, with ice channels between. The walls were double, about two inches thick. The body was suspended on four longitudinal, one rear transverse and two rear coil springs.

WEIGHING-IN OF THE INDUSTRIAL VEHICLES IN THE TUILERIES GARDENS, PARIS, BEFORE THE START.

MOTOR OMNIBUSES IN LONDON.

LONDON, June 12.—Between 400 and 500 self-propelled omnibuses are now regularly in use in the streets of London, and their number is increasing at the rate of ten or twelve every week. If the present ratio of increase continues, the end of 1907 should see the final substitution of motor 'buses for the slow horse traction in this particular branch of public passenger service.

The introduction of motor 'buses was long delayed; even at the end of 1904 there were only thirty in use; but last year there was

TYPICAL LONDON MOTOR 'BUS AT MARBLE ARCH.

a sudden awakening, and by the end of December there were 250 in active service. One hundred more were added to the number during the first three months of 1906. The sudden rush to secure vehicles for this purpose overwhelmed the few English companies engaged in building them, and consequently many orders were placed with French and German concerns and with small home builders. As a result, the number of British manufacturers is rapidly increasing.

Nearly all of the motor omnibuses are driven by gasoline engines. The largest number of any one make—160 at the end of last March—are of German manufacture, known as the Milnes-Daimler. Ninety others were made under German license by the English firm of Straker & Squire. The third largest number of one make were De Dion 'buses, built in France, and it was reported that the entire output of De Dion omnibus chassis for this year had been engaged by the London General Omnibus Company. Thirty other vehicles were built by Durkopp in Germany, while at the close of March there were ten steam 'buses built by Clarkson in operation and many more had been ordered. No electric vehicles of this type are used.

Thirty-four to thirty-six passengers can be accommodated in the later styles of 'buses, which are all of the double-deck type seating sixteen inside and eighteen on top. Police regulations forbid the carrying of a canopy top to shelter the passengers in the outside seats. The interior of the body is generally lighted by acetylene lamps supplied from a single generator carried outside.

The earlier 'buses were of about 24 horsepower, but the newer ones are commonly of 30-40 horsepower developed by four-cylinder motors. There is, of course, great variety in design, but the general tendencies are toward shaft drive to eliminate the noise of side chains, magneto ignition set to spark only at one position so as to dispense with timing. The engine is usually of the vertical type, located forward under a bonnet or directly under the operator's seat and footboard. In the Wolseley (English) 'buses of the new type brought out this year, the engine, instead of being horizontal as in the pleasure cars, is vertical. It develops 30 horsepower at 900 revolutions per minute. Sliding gears give four forward speeds and reverse. Side chains drive to the rear road wheels. The Leyland 'buses are the combined production of the Lancashire Steam Wagon Company and the makers of the well-known Crossley gas engine. They are driven by four-cylinder, vertical explosion motors of 22-30 horsepower at 800 to 1,000 revolutions. The frame is of channel steel and the drive by shaft to live rear axle.

Most of the London 'bus companies have adopted special names for their vehicles to distinguish them from those of the other companies, as, *Pioneer, Vanguard, Rapide, Arrow,* and the like, conveying the idea of priority or speed. One of the *Pioneer* 'buses is shown in the illustration of a London street scene. It was built by Scott, Stirling & Co., Ltd., of Twickenham, and is typical in general appearance of the 'buses in common use.

PARIS INAUGURATES ITS 'BUS LINES.

PARIS, June 8.—The placing on the Paris streets of the first motor omnibuses is a matter of some importance, made of still more moment by the delay in instituting the innovation. The high price of fuel in Paris and the uncertainty regarding the renewal of the monopoly enjoyed by the company now operating omnibuses are the causes responsible for the fact that the French capital is adopting the motor omnibus for its own use only after London had been overrun with such vehicles.

Two power 'bus lines have now been started, one extending east to west from the Hotel de Ville to the Porte Maillot and the other north and south from Montmartre to St. Germain des Pres. Fifteen 'buses will be used on the first route and seven on the other. This move is still regarded by the company as an experiment, although trials have been made with cars of nearly every important French make for more than a year. More changes from horses to motors are to be expected shortly, however.

The chassis of the 'buses now in use were supplied by Eugene Brillie and were constructed in the artillery works of Schneider & Co., at Le Creusot-Le Havre. They are of 32-40 horsepower, with four-cylinder engine placed under the driver's seat; transmission is by propeller shaft. The total weight of the 'bus, without passengers, is 9,614 pounds. The bodies are practically the same as those on the regular horse-drawn 'buses, except that a canopy has been placed over the seats on the upper deck.

Either gasoline or alcohol can be used for fuel, alcohol now being employed, although gasoline was used in the Salon trials. The carbureter is of the float-feed type with extra automatic air inlet and is heated by exhaust gases from the engine. The

BRILLIE 32-40 HORSEPOWER OMNIBUS IN PARIS STREET.

change-speed gives three speeds forward and reverse, manipulated by a single lever, and drive is direct on high speed. A live cross shaft carrying the differential has spur gears at its ends that engage with internal gears on the brake drums bolted to the rear road wheels.

Compactness and accessibility have been sought in designing these vehicles, and very little space is occupied by the engine. The gasoline tank, holding fourteen gallons, is under the driver's seat. The radiator, which is in front, has the water tank combined with it. Double block solid rubber tires are fitted to the wheels.

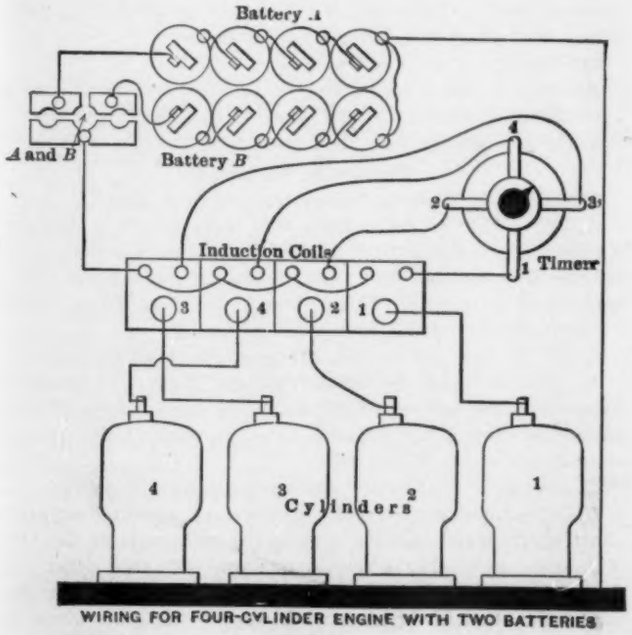
CATECHISM OF THE GASOLINE AUTOMOBILE*—IV

By FORREST R. JONES, M.E.

Q.—How many induction coils are used for a two-cylinder engine?

A.—Two, generally. A coil is provided for each cylinder, and a wire connects its high tension terminal to the spark plug in the cylinder.

In more unusual cases, however, only one induction coil is used, in which case it must have two binding posts for the terminals of the secondary winding. One spark plug is connected to one of the secondary binding posts of the coil and the other spark to the other high tension terminal of the coil. The path of the high tension current is then from one terminal of the high tension coil to its spark plug, thence across the air gap to the metal of the cylinder, through which it travels and jumps to the central wire of the other spark plug, and then goes back to the remaining terminal of the secondary coil. By this method of wiring a spark is produced twice as often in each cylinder as is necessary.



WIRING FOR FOUR-CYLINDER ENGINE WITH TWO BATTERIES

FIG. A

Q.—When four induction coils are used for a four-cylinder engine, how are the electrical connections made between the different pieces of the apparatus?

A.—The four coils (Fig. A) are usually placed in a box side by side. A wire leads from one terminal of the battery to the induction box, and connects to the terminals at one end of the primary winding of each induction coil. The remaining terminal of each primary winding is connected to its own contact piece on the timer, so that there are four wires between the timer and induction coil. The rotor of the timer closes the electric circuit through the four primary coils in succession, thus causing only one spark plug to operate at a time and at the proper instant.

Q.—What is the high-tension distributer system of jump spark ignition?

A.—It is a method by which only one induction coil is used for any number of cylinders. In some designs the rotor of the timer is placed on the same shaft as a metal distributing arm (or other device) so that they both rotate together at the same speed. For a four-cylinder engine the rotor of the timer should close the primary circuit through the induction coil four times per revolution of the rotor at equal intervals. Each time the primary circuit is closed the distributer arm is brought opposite the terminal of a wire leading to one of the spark plugs so as to complete the electric circuit between that plug and the high tension coil. Since the distributer is brought opposite each terminal of the four spark plug coils in succession, a spark will be produced in each cylinder only when required.

In the distributer system the apparatus can be made very compact and all placed in one box except the battery and spark plug. Since only one induction coil is used, it must perform four times the service required of each coil by the system of ignition, using one coil for each cylinder in a four-cylinder engine.

Q.—What is the low tension (make-and-break) system of ignition?

A.—One in which a low tension current of electricity is interrupted by separating the contact points inside the combustion chamber so as to draw an electric arc sufficient to ignite the charge.

Q.—From what source may the current for low tension ignition be secured?

A.—Either from a battery or an electric generator (dynamo, magneto).

Q.—Is the electric battery satisfactory for constant service in low tension ignition?

A.—Not generally. The demand upon it for current is so great by most methods of using the low tension current that dry cells are soon run down or a storage battery soon needs recharging.

Low and High Tension Magnetos.

Q.—Describe a low tension magneto.

A.—As the name indicates, magnets (permanent magnets) are used for a portion of the machine. These are generally U-shaped and three or four are used side by side. The free ends have pole pieces of soft iron or steel attached so as to leave an opening between them in which a cylindrical armature may turn. The armature is made up of disks of very soft iron, about which is wound, in a direction parallel to the axis of rotation, electrically insulated copper wires of several coils. The two ends of each coil connect to adjacent segments of a commutator of a form which may be made by cutting a ring of copper into several pieces by radial slots, then separating the pieces from each other by mica insulation and also separating them from the other metal parts of the machine with the same insulation. Each segment has a terminal from each of a pair of adjacent coils connected to it. When the armature rotates in the magnetic field between the pole pieces of the magnets, an electromotive force is generated in it, and a current of electricity may be taken from it by means of copper or carbon brushes resting upon the rotating commutator at diametrically opposite points. The voltage produced is proportionate to the speed of rotation of the armature, and the electric current is increased in about the same proportion for the kind of service under consideration. A governor is frequently applied to limit the speed at which the armature is driven so that the voltage will not become higher than is desirable.

Q.—Describe one form of mechanism for low tension ignition.

A.—A stationary rod or bar extends through the wall of the combustion chamber into the combustion space, and is electrically insulated from the metal of the cylinder by mica or porcelain. Another part also extends into the cylinder, but is not electrically insulated from it. It has a running fit in the hole it fills so that an arm attached to it inside the combustion chamber can be oscillated as a rocker arm both to bring it into contact

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with the insulated rod and to open the contact by the use of proper mechanism.

A spring is used outside the combustion chamber to hold the contact points together inside. When in operation the points are kept closed most of the time and an electric current from some source, such as a low tension magneto or a battery, flows through them.

An igniter cam or other device is attached to some rotating part of the engine so as to separate the contact points at the instant a charge is to be fired in the cylinder. The separation of the points draws an electric arc (single spark), which ignites the charge.

When a battery is used a "kick-coil" is placed in series with the circuit. The kick-coil has only one winding, which is of insulated heavy copper wire. The customary core of soft iron passes through the center of the coil. The kick-coil causes a longer and stronger arc to be drawn between the contact points.

Q.—What is a high tension magneto for jump-spark ignition?

A.—One that generates an electric pressure high enough to produce a jump spark across the spark gap of an ordinary spark plug without the aid of any auxiliary apparatus such as an induction coil or timer. In most forms it is a combination in one machine of a magneto and induction coil. Sometimes a condenser is also a part of the machine.

In one type the armature generates a moderate pressure which charges a condenser. The latter is then discharged through the primary of the induction coil which is part of the machine, thus producing a high tension current in the secondary. A high tension distributer is in circuit with the secondary of the induction coil, and its rotating arm is brought opposite one of the terminals to which a wire leading direct to the spark plug is attached. The discharge from the condenser through the primary coil occurs when the distributer arm is opposite the terminal of the wire leading to the spark plug. This occurs consecutively for all the spark plugs.

In another type the current from the low tension armature passes directly and intermittently through the primary of the induction coil so as to produce a high electromotive force in the secondary at the time a spark is required. The distributer arm is used in the same manner as previously described. The induction coil is a component part of the generator.

Forms of Friction Clutches.

Q.—What is a friction clutch and how used?

A.—A device for transmitting power in which the frictional resistance to the sliding of one smooth surface over another is utilized as the means of driving one part by another.

One part of the clutch is generally attached to the crankshaft of the engine and the mating part to a shaft which transmits power to the remainder of the transmission that connects to the driven wheels.

Q.—Why is a friction clutch adopted for this purpose?

A.—Because it is necessary to give a gasoline engine considerable speed of rotation before attempting to move the car by its power. This makes it necessary to have some means, as the friction clutch, by which the parts that are at rest can be gradually set into motion by the rapidly rotating shaft of the engine.

Q.—What is a cone friction clutch?

A.—One in which the contact surfaces (male and female) that transmit power by their frictional resistance to sliding are conical in shape (cone frusta). The parts are pressed together, generally by a spring.

Q.—What is a multiple-disk friction clutch?

A.—One in which a number of disks placed on concentric axes transmit power by the frictional resistance to sliding between their surfaces when pressed together. The ordinary type consists of two sets of flat metal disks, each set composed of alternate disks. Each disk lies between a pair of the other set. One set is attached to a shaft passing through their centers, and the other set to a sleeve or casing surrounding them. The disks are keyed so they must rotate with the part to which they are attached, but are free to slide in the direction of the length of the shaft or thimble. The clutch is put into action by pressing the disks together, usually by a spring.

Q.—What advantage has a multiple-disk over a pair of flat surfaces rubbing together?

A.—If only one pair of friction surfaces were used to transmit a given amount of power at a given speed of rotation, the pressure between the rubbing surfaces would have to be much greater than when a number of disks of the same diameter and material are used. Thus if the number of rubbing surfaces is thirty the pressure required to hold the disks together for transmitting the power would be about 1-30 of that necessary for only one pair of rubbing surfaces of the same form and size.

Q.—What other forms of friction clutches are used?

A.—Those in which a band or outer part grips a rotating cylindrical piece, or an expanding cylindrical piece presses outward against a hollow part.

Q.—What materials are used for the rubbing surfaces of friction clutches?

A.—In the cone clutch the inner member is generally faced with leather which rubs against the smooth metal surface of the outer part; any metal may be used, but cast-iron and steel casting are more common. In a multiple-disk clutch steel on steel, steel on bronze, cast-iron on bronze, or metal rubbing against vulcanized wood fiber all give good service.

Q.—What is a positive clutch?

A.—One in which projections or jaws on one member fit into corresponding recesses of the other so that, when the jaws are brought into engagement, they must turn together without slip.

Change-Speed Gears.

Q.—What is a change-speed transmission gear?

A.—A number of gear wheels with teeth, generally inclosed in a case and placed just back of the friction clutch, which are used to give different speeds of travel to the car for a given speed of rotation of the engine. This is done by bringing different groups of gears into action for each speed of travel.

Q.—What is a sliding-gear change-speed transmission?

A.—One in which the different groups of gears of unequal diameters are brought into mesh by sliding one or more of the set along the shaft which supports it. The teeth of the gears are thus slipped between each other.

Q.—What is a planetary change-speed transmission?

A.—One in which some of the gears are supported on pins or short shafts which revolve around the main axis of the group. The same gears always remain in mesh with each other. Different sets are brought into action by stopping the rotation of one or the other of the parts which support the gears whose axes revolve around the main shaft. To stop the rotation of any part it may be gripped by a strap or band similar to a band brake.

Q.—What is an individual-clutch change-speed transmission?

A.—One in which the same gears are always in mesh, and different pairs or sets are brought into action by the use of a clutch which operates for that set of gears only. One clutch is provided for each set.

Q.—What is meant by direct drive?

A.—When the shaft connected to the rear member of the friction clutch is brought into direct engagement with the shaft which carries power to the wheels so that none of the change-speed gears are used for transmitting power. In many designs the change-speed gears revolve idly, however, when the direct drive is on.

Q.—What is the propeller shaft?

A.—The shaft extending from the change-speed gear box to a bevel gear which engages with its mate on the rear axle and transmits power to the latter.

Duly authorized chauffeurs holding permits will be allowed to drive automobiles through the Simplon Pass after notifying the gendarmes. The passage can only be made in the day time, and four and a half hours must be occupied in making the trip, the speed being checked by officials.

EQUIPMENT FOR A TOURING CAR

TOURING cars, when purchased new, are sold "fully equipped." This is a somewhat indefinite condition, as the equipment depends a good deal on the price of the machine, the highest priced cars usually being more completely fitted out than the lower priced machines; if any general distinction can be made, it is that the expensive cars are fitted with the essential attachments required in long-distance touring, while the cars selling at moderate prices are equipped with such articles as are absolutely needed for operation within the laws in daily use.

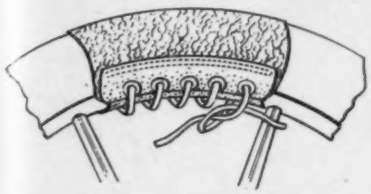


FIG. 1.—TIRE MANCHON OR SLEEVE.

It is the custom to sell new machines equipped with tires, a full set of gas headlights, generator, oil side lamps and tail lamp, horn, set of tools for adjustments and repairs, oil can, tire pump and tire repair outfit. Except in rare cases, the purchaser himself must buy such additional equipment for touring as the extension top with its storm curtains and boot, hampers or steamer trunk, fuel and oil funnels, lifting jack, distance and speed recording instrument, and various other articles. Of course, he has the top fitted before the car leaves the factory, but the other things are added as required. Many accessories that are offered in every automobile supply store are almost essential to the satisfactory use of a car, even for short runs in and about the city; others are found particularly useful in cross country driving where repair-shop and supply facilities are not to be depended upon, and many others are by no means indispensable but are in the nature of small refinements that the car owner may wish to have. The man who does much long-distance touring quickly learns what can be dispensed with, and more slowly discovers the many small articles that may not often be wanted but which when wanted are most essential at the time and are found to be unobtainable unless carried in the car. In the latter class are usually to be placed such "spares" as extra valve sets, including springs and stem keys, cotter pins, nuts, bearing balls, copper gaskets, ignition cable, extra chain links and rivets, bolts, washer leather, asbestos packing, and so on.

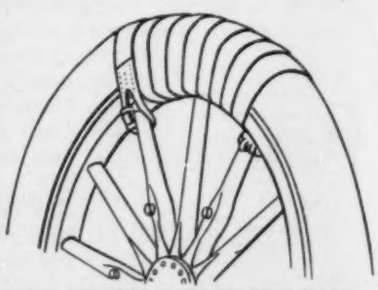


FIG. 2.—ELASTIC RUBBER TIRE BAND.

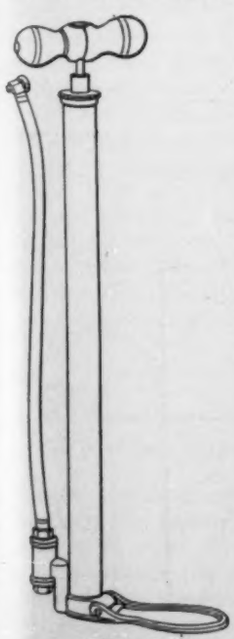


FIG. 3.—FOOT PUMP.

An effort will be made here to mention briefly the articles that experience has shown to be most desirable in the full equipment of a car for daily use about town; in subsequent issues the accessories more especially adapted for touring and articles of clothing found needful or desirable will be treated.

Lap Robes and Rubber Aprons.

Assuming that the car as purchased is equipped with the full set of lamps and generator, horn, simple repair tools and tire repair kit, the user is likely to discover early need for other protection against cold weather and rain than is afforded by the clothing worn. It is advisable, therefore, to carry in the car at all times one or two lap robes and rubber storm aprons. Changes of weather and storms come on suddenly, and even in a half-day's run one may catch a heavy cold by driving through raw and chilly air or may get soaked in an unexpected shower. Rubber rain aprons are made that extend over the whole seat of the car as well as the occupants, only the passengers' heads protruding, thus keeping the seat cushion dry—a very important point in the matter of comfort, as experience has proved.

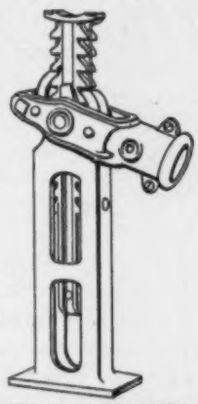


FIG. 4.—AUTO JACK.

Extra Tire Shoe and Tube.

Aside from minor engine troubles, the tires are more likely to give trouble than anything else. It is never safe to venture from the garage without a spare inner tube in the car. Spare tubes are sold packed in round or rectangular cardboard boxes, with plenty of French chalk sifted between the folds. If they cannot conveniently be kept in the original package, they should be removed and wrapped carefully in heavy cloth to protect them from injury by tools and by contact with grease and gasoline. As much as possible of the chalk should be retained, or more sprinkled between the folds to prevent the rubber cracking.

If a run of fifty miles or more is to be undertaken, it is best to carry an extra shoe, if there is any doubt whatever about the condition of any of the tires on the wheels. Waterproof oilcloth tire covers are made to be laced over the shoe to protect it against chafing, dirt and water, and these can be obtained at low prices. Special metal brackets are also made now to be screwed or bolted to the car on the operator's side or to be attached at the rear of the body for carrying an extra shoe. For temporary tire shoe repairs the pigskin tire-sleeve (Fig. 1) that laces over a cut or weakened place serves very well, while a newer device for the same purpose is the tire bandage, a band of very elastic rubber three inches wide and six feet long, with straps and buckles at the ends. This can be wound tightly around the shoe and buckled in place around a spoke while the tire is partially deflated, as in Fig. 2, and upon pumping up the tire it binds firmly in place and can be used for several hundred miles of driving if necessary. The band is very easily applied and will prevent a blow-out of the inner tube through a cut in the shoe.

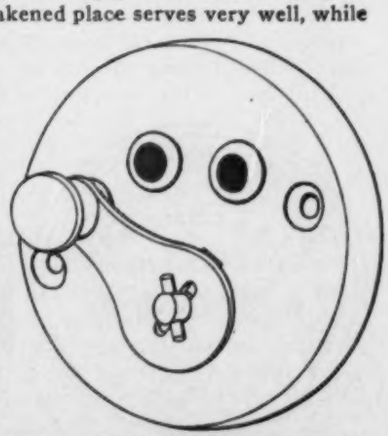


FIG. 5.—LOCK AND CUT-OUT SWITCH

Good Tire Pump Desirable.

Too often the tire pump furnished with the car is not all that could be desired. Pumps of many kinds and qualities are in the market, but for carrying in the toolbox of a car the straigh plunger foot pump (Fig. 3), of good material and well

made, will be found satisfactory. It should be substantial, with good connections and hose, and it is best to select one with a long barrel of small diameter, for an applied pressure of fifty pounds in a barrel one inch in diameter is just as effective as a pressure of 200 pounds in a barrel two inches in diameter; in other words, it is four times as hard to pump with the larger size.

FIG. 6.—DASHBOARD CLOCK.

Selection of a Jack.

The jack should be as much a part of the regular equipment of any machine as the tire repair kit, but it is seldom included in the equipment as the car is delivered from the factory. When it is omitted the owner can exercise his own judgment in making a choice. For serviceability the screw jack with ratchet lever cannot be excelled, but if there is reason for economizing in the matters of weight and space occupied, the light folding jacks may be preferred. In either case, it is important to see that the jack is sufficiently low to easily pass under either axle when the tires are deflated. A six-inch lift is sufficient for any purpose. Fig. 4 shows a jack which can be raised or lowered at will by working the same lever, a feature common to a number of jacks.

Lock-Switch for the Dash.

Meddlesome children and malicious persons of more mature years are so common in the city that it is customary to take precautions against the danger of having them start a car when the owner has left it unattended for a short time in the street. A common means of safeguarding it is to attach a lock-switch to the dash, if the one provided with the car is not of that type. This device is so made that the key can be removed and put in the pocket, thus making it impossible to close the ignition circuit. A simple form of lock-switch is shown in Fig. 5.

Dash Clock of Convenient Form.

Another attachment that is found of great convenience is a dash clock. Some of these clocks are mounted in an inclined polished brass case to be screwed to the dash and hold the face of the timepiece in the most convenient position for the driver to read, as in Fig. 6. These are made in both one-day and eight-day wind. They are commonly attached by concealed means, so that they cannot be readily removed by turning out a few screws.

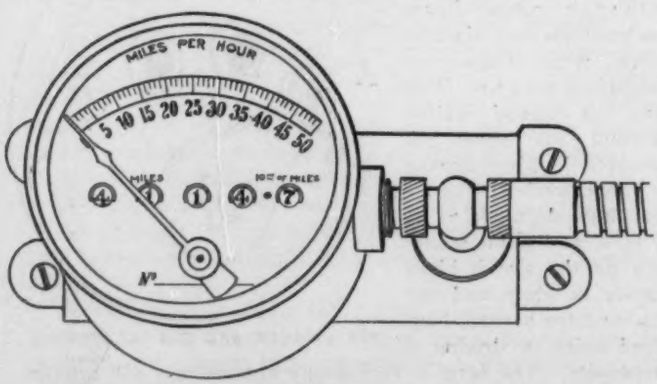


FIG. 7.—SPEED INDICATOR WITH CENTRIFUGAL MOVEMENT.

Vigilance of the police in cities and towns makes it desirable to keep on the safe side of the speed laws, which accounts in large measure for the popularity of speed indicators. These are made in a dozen different styles and operate on several principles. One of the earliest and most used instruments (Fig. 7) operates on the principle of a centrifugal governor, the actuating mechanism revolving inside a circular case mounted in any convenient place on the dash and moving a pointer across a scale showing on the dial. The mechanism is driven by means of a flexible shaft connected by spur gearing with the hub of one of the front wheels of the car. Another type of speed indicator has a short vertical dial resembling a thermometer in which a minute column of colored alcohol rises and falls under the action of a small centrifugal pump driven by a spur gear on the road wheel, the alcohol flowing back gradually. No springs or weights are employed, and as the liquid does not dance up and down in the glass tube, its position can be read easily on the scale. A later form of speedometer (Fig. 8) is operated magnetically, the rotation of a circular magnet directly underneath a circular metallic dial tending to rotate the dial against the action of a delicate coil spring. The balance between the magnetic force and the spring tension determines the reading of the scale. The magnet is rotated by means of a flexible shaft driven by the front wheel of the car through the medium of spur gearing.

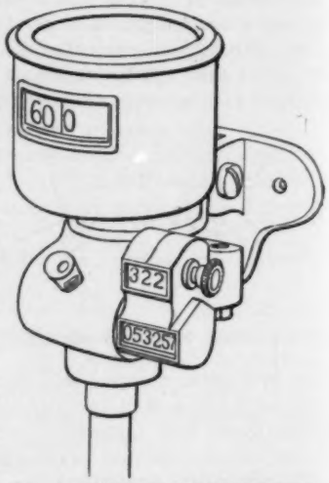


FIG. 8.—MAGNETIC SPEEDMETER.

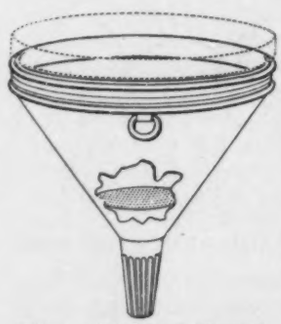


FIG. 9.—GASOLINE FUNNEL.

Distance Measuring Instruments.

There is slight need of a distance measuring instrument on a car for strictly city use, but such advancement has been made in the manufacture of delicate instruments for recording the movements of an automobile that it is the common practice now to fit a machine with a combined cyclometer speed indicator. Generally the instruments of this nature are a combination of the well-known cyclometer with one of the foregoing types of speed indicating devices, as shown in Fig. 8.

Filling and Straining Funnel.

In the city use of a car there is not imperative need of fuel and oil funnels and a hydrometer, but it is well to have them, as they are very useful on runs of any length. There should be separate funnels for the gasoline and the lubricating oil, and it is well to use the former only for gasoline. Various forms of gasoline funnels are made and the buyer cannot go far wrong in making a selection. A convenient form is shown in Fig. 9. It has a gauze strainer just above the nozzle and a separate ring at the top with a shoulder and reduced portion adapted to fit inside the top of the

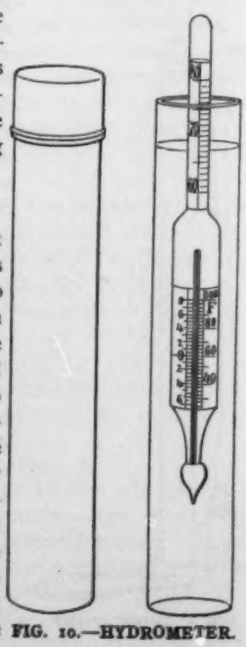


FIG. 10.—HYDROMETER.

funnel after a piece of chamois skin has been spread across it. The ring prevents the gasoline from splashing out or overflowing when it does not run through the chamois as rapidly as it is poured into the funnel. Careful operators make it a point always to strain through chamois all the gasoline that goes into the tank. Of course, common sense dictates that the chamois must be kept clean and that if the same side is always placed downward when filling the tank whatever foreign matter is caught on the upper side one time will not be washed off the under side into the tank the succeeding time the chamois is used.

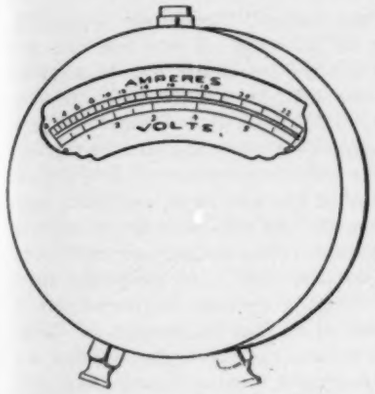


FIG. 11.—VOLT-AMMETER FOR TESTING.

Hydrometer for Testing Fuel.

An engine does not work so well with stove gasoline of 68 degrees test or less as with gasoline of 76 degrees test, now commonly known as automobile gasoline. As it is a difficult matter to distinguish between them, however, a hydrometer is a useful instrument to carry in the car, so that when there is any doubt a test can be made. In Fig. 10 is shown a hydrometer especially provided for automobile use. It is graduated by the Baumé scale with a supplemental thermometer scale for making corrections for variations of temperature. The instrument is wrapped in a soft flannel pouch and packed in a glass test tube which fits inside of a nickeled brass case with cap.

Volt-Ammeter for Battery Tests.

Batteries may run down at any time and anywhere, and although the ease of replacement in towns makes it less necessary to test them frequently, the man who stables his machine on his own premises will have use for a volt-ammeter. These are sometimes permanently attached to the dash of the car, but more often are carried separately in a leather case or chamois pocket. In Fig. 11 is shown such an instrument, made, like most of them, with a strong metal case, leaving only the scales and the end of the pointer visible under a glass face. The upper scale reads from 0 to 30 amperes and the lower scale from 0 to 6 volts. For dry batteries an ammeter with only one scale is used, reading up to 30 amperes. There are terminals at the lower side of the case for making connection with the battery. These are to be connected in short-circuit across the terminals of each cell in turn, using a very brief

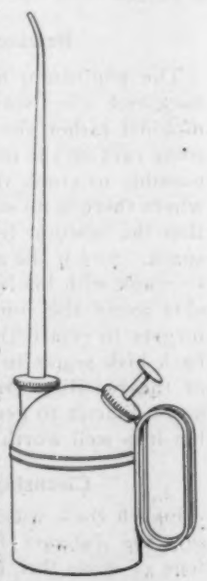


FIG. 12.—OILER.

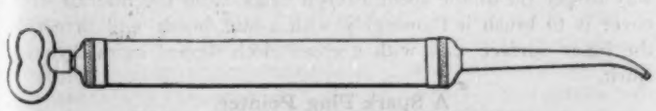


FIG. 13.—A SIMPLE OIL GUN OR INJECTOR.

contact—just long enough to get the reading, as the test is severe on the battery. A cell giving less than three to five amperes on shirt circuit has but a short useful life remaining. Secondary or storage batteries, which are used extensively for ignition purposes, are tested for voltage as well as amperage. A fully charged cell should show 2.25 volts, and when the voltage has dropped to 1.8 volts the cell should be recharged. Two cells are tested in series, so that the voltmeter should read up to 5 volts.

Oil-Cans and Oil Guns.

Oil-cans and oil or grease guns should come with the regular equipment of tools with the car, but often they become battered or get lost and must be replaced. A very useful form of force oil-can is shown in Fig. 12. It is called a "railroad oiler," as it is of the type used by locomotive engineers. The long, tapering nozzle is most convenient in getting the oil to inaccessible places, and there is a small pump inside the can with a plunger above the handle where it can be pressed by the thumb to force oil through the nozzle when the can cannot be tilted to cause a flow by gravity. The pump valve can be removed for inspection and the nozzle can also be unscrewed.

An oil gun is useful for a variety of purposes. It can be used for injecting lubricating oil into unhandy bearings and also for washing out gummed and gritty bearings or cylinders with gasoline. A simple and substantial oil gun with removable nozzle is illustrated in Fig. 13.

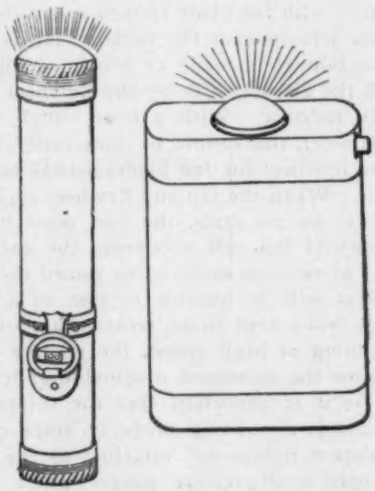


FIG. 14.—PORTABLE ELECTRIC LAMPS.

Portable Electric Lamps.

Frequently a minor adjustment or repair is necessary after nightfall where no lamp throws a light that is suitable to work by. It is both inconvenient and unsafe to remove one of the oil side lamps from the car to make an examination, and is still less satisfactory to use matches. For this purpose automobilists have found very useful the small portable electric lamps (Fig. 14) that are in the market. They are made in two forms, tubular and shaped like a flask to go in the pocket. Special dry batteries are made to fit them. At one end of the case is a tiny incandescent lamp bulb protected by glass, either plain or in the form of a lens. Pressure by the thumb on a button makes connection between the battery and the lamp, so that illumination can be had just when and as long as desired.

There are, of course, many other fittings and special accessories that have not been mentioned, but as most of them are especially suitable for use when touring, they will be treated in a separate article in a later issue.

ASBURY PARK AUTOMOBILE CARNIVAL.

ASBURY PARK, N. J., June 25.—William J. Morgan, of Newark, appeared before the beach commission at its meeting this week and made arrangements with that body for the use of the Arcade, one of the pavilions on the beach front, for Wednesday, August 22, through Saturday, the 25th, when he will hold his annual automobile carnival.

For two years past this event has been held at West End. In connection with the carnival the usual endurance tests, races and exhibit of cars will take place. Mr. Morgan also made arrangements to have Pryor's Band in attendance at the carnival.

Montreal has just discovered a law recently passed abrogating the right of the city to license automobiles. The fees for licenses already issued will have to be returned.

A FEW THINGS DRIVERS SHOULD KNOW

The Science of Creating an Artificial Draft.

The fan behind the radiator is usually driven by a belt. It draws a large volume of air through the cooler and discharges it partly through slits or "louvres" cut in the sides of the bonnet and partly backward under the dashboard. In cars fitted with clutches of small diameter, such as disk clutches or others of special types, the flywheel is sometimes made with fan-blade spokes, set to draw air backward. With this arrangement the radiator fan is sometimes omitted and the bonnet is made as nearly air-tight as possible, so that all the air drawn in by the flywheel fan must come through the radiator. With a cone clutch, or any clutch of large diameter, this cannot be done easily, for the space left free in the flywheel for fan blades would be too small for practical use. When the fan and flywheel spokes are used together to cause an air draft, the two must be so arranged that the flywheel fan will accelerate the current; if the spokes are set at such an angle as to retard the passage of the air, the effect will be inferior to that of a fan alone. And if the fan, when used alone, retards the flow of air when the car is running at high speed, the cooling effect will naturally be below the maximum obtainable under proper conditions.

As it is important that the driver should know that his water is circulating properly, some cars are fitted with "circulation indicators" attached to the dashboard. These are simply small-pressure gauges which show little pressure on the dial when the water is running, showing that everything is right. Another type of indicator consists of a little inclosed paddle-wheel with a glass front on its casing; the wheel revolves with the passage of the water.

In winter, when the water is liable to freeze and burst the water jackets, radiator, and make havoc generally, the pure water is replaced by some solution unaffected by low temperatures. A calcium chloride solution is commonly used for this purpose, but there are others that answer the purpose fully as effectively.

How to Adjust the Vibrator.

The correct adjustment of the vibrator on the coil is an important matter, not only from the fact that a better spark is produced when the adjustment is right, but also because the current consumption depends to a considerable extent upon the swing of the little spring. A good rough-and-ready rule for the novice is to set the "buzzer" so that it sings the highest note that it can sustain clearly and without harshness. This can be done by first screwing down the adjusting screw until the buzz is stopped. Then gradually turn back until a high, clear buzz, without rattle or hoarseness, is obtained. With dry batteries it is sometimes necessary to slack back the screw a little more as the cells run down. It is of course possible to set the vibrator so that it will work fairly well whether the battery is brand new or in the last stages of its usefulness, and a majority of coils are so adjusted; but to make a new adjustment, or to get the best work out of the coils, the above method may be followed.

High-Tension Current Easily Shortcircuited.

The high voltage of the secondary current of the ignition system makes it unnecessary to have a clear metallic path to cause a short circuit. A mysterious "short" in the secondary was, after weeks of theorizing without effect, traced to an oil-soaked rubber cloth hanger in front of the seat of the car. The current "shorted" across this to the frame of the car, frequently shocking the driver through the steering wheel and puzzling him sorely.

Revolving Cylinder Types of Air-Cooled Motors.

There is a group of air-cooled motors that do not depend on fans nor natural draught for cooling. These are the so-called revolving cylinder motors in which the crankshaft remains stationary while the cylinders, from three to five in number, rotate around it. A commercial form of engine of this type has the crankshaft set vertically and the cylinders rotating around it in a horizontal plane. Longitudinal ribs are cast on the exterior of the cylinders, and the rapid passage of the cylinders through the air keeps them quite as cool as is necessary. Engines of this class have also been made with the crankshaft horizontal and the cylinders moving in a vertical plane. A rotating cylinder engine affords a striking example of the relative cooling efficiencies of radiation and convection. After having run the engine rapidly for a time, and then quickly stopping it, the hand may be placed on the cylinder head flanges without discomfort; but ten seconds later the heat of the same spot would be unbearable. The reason is that while the cylinders are moving the air with which they come in contact is constantly changing and new volumes of cold are constantly available to take up the heat. When the cylinders are stationary, however, they are in contact with practically still air which rapidly becomes saturated, so to speak, and unable to absorb heat as fast as it passes from the interior to the exterior of the cylinder.

Beware the Treacherous Back Kick.

The unpleasant and sometimes painful consequences of a back kick when starting the motor are apt to make the automobilist rather shy of the crank for some time. There are some cars on the market with attachments which make it impossible to crank the motor with the ignition advanced, but where there is no such arrangement care must be taken to see that the ignition lever is placed in a position to retard the spark. And if the automobilist will take the trouble to learn to crank with his left hand instead of the right, he will probably avoid the consequences of his carelessness in case he forgets to retard the spark. When the left hand is used, a back kick seems to throw the hand and arm out of the path of the recoiling crank nearly every time. It is sometimes more difficult to get the knack of starting with the left hand, but it is well worth while to acquire the habit.

Cleansing Tire Covers of Spent Chalk.

French chalk within a tire cover should never be washed out, says the *Autocar* (Eng.). Some professional drivers are very fond of doing this, however, as it is an easy method of getting rid of it. But, like most proceedings that avoid trouble, it is a very undesirable thing to do, for the reason that it is seldom that sufficient time can be allowed to permit of thorough drying, and if there be any weak places in the fabric the moisture which penetrates them only serves to weaken them the more. The proper way to get rid of the spent French chalk from the interior of a cover is to brush it thoroughly with a stiff brush, and then rub the inner surface well with a clean cloth dipped in methylated spirit.

A Spark Plug Pointer.

It is a good thing for the novice to remember that the gap a spark will jump outside of the cylinder is by no means an indication of what it will do inside the cylinder in the middle of a highly compressed charge. A plug that will spark vigorously and hotly when tested outside of the cylinder in the usual way may refuse to spark at all at the critical time, or may pass such a weak spark that it will not ignite the mixture. To be effective the spark must be violent.

NATIONAL HIGHWAY COMMISSION ADVOCATED

WASHINGTON, D. C., June 25.—The latest aspirant for fame as a good roads advocate is Representative Rhodes, of Missouri, who has introduced a bill in Congress that will please automobilists in every section. It seeks to establish a national commission of public highways, the object and purpose of which is to cooperate with the several states and territories in the construction and improvement of the public roads, and to bring about as far as practicable a uniform system of construction and improvement of the public roads throughout the United States. The commission is to consist of three members, one of whom is to be appointed by the President of the United States, and who must have practical knowledge of road engineering and construction. He is to have a salary of $5,000 a year. The other two members are to be the Secretary of Agriculture and the Postmaster-General. The latter is to be president of the commission, while the civilian member is to be the secretary.

The bill then goes on to provide that the legally constituted authorities of the several states and territories, under whose jurisdiction are placed the public roads, on having expended a given sum of money subsequent to January 1, 1907, in the establishment or improvement of the public roads of any state or territory, shall file in the office of the auditor of such state or territory a duly certified and authenticated statement of all money so expended. When any state or territory shall make application to the commission for national aid for the construction or improvement of its public roads, according to rules and regulations laid down by the commission, it shall be the duty of the commission to immediately appropriate a sum of money equal to the amount expended by such state or territory in the establishment or improvement of its public roads within twelve months prior to the date of the application. The sum appropriated to any one state or territory must not exceed $500,000 in any one year after January 1, 1907.

For the purpose of carrying out the provisions of the bill the sum of $50,000,000 is appropriated, to be available not to exceed $25,000,000 a year during the years 1907 and 1908.

There are a number of good features about this bill that commend it to many members of Congress, and it is likely to receive a great deal of attention and consideration at their hands.

CONGRESSMAN SULZER'S STRONG PLEA.

WASHINGTON, D. C., June 23.—During the recent consideration of the sundry civil appropriation bill in the House of Representatives, Representative Sulzer, of New York, delivered a good roads speech that was considered a gem by his colleagues. He said he took an abiding interest in this all-absorbing question for better highways throughout the land by some plan of governmental assistance; that he was for the cause and in the fight to stay. He told the House that he had given this matter of national good highways careful study, and considerable investigation, and he believed it was one of the most important questions now before the American people. The appeal for good roads is a patriotic demand that comes from every section of the land, and Congressman Sulzer asserted that the time is at hand when the Congress of the United States must take up the matter seriously and legislate intelligently on the subject. The question will not down, he said, and it cannot much longer be ignored. The people want it, and what the people want they generally get. He called attention to what President Roosevelt recently said on this question, and he hoped ere long the President would send to Congress a special message urging that body to take some immediate and definite action regarding Government aid to good road building.

After pointing out how much money the Government annually appropriated for the army and navy, the rivers and harbors, the public buildings and grounds, for fortifications and coast defenses, and other purposes, he said that in more than fifty years not a dollar had been appropriated by the Government for good roads. He declared the United States must build and possess good roads. The General Government must lend its aid to their construction. They must be free to all the people and stretching away in all directions throughout the length and breadth of the land. It is essential to our development. We are far behind the other great governments of the world in the construction and maintenance of good roads. Every person who has traveled abroad is at once impressed with this unfortunate fact. It is a reflection on our energy, a sad commentary on our sagacity, and a humiliating comparison with our progressive enterprise in every other field of endeavor.

LEGISLATION IN WASHINGTON STATE.

OLYMPIA, WASH., June 21.—State Highway Commissioner Joseph M. Snow has prepared a "state aid" highway bill, patterned after the New York law, which he will urge at the next session of the legislature. In brief, it is the purpose to have all roads built under expert supervision to the end that first-class and permanent highways may be secured. The bill provides for state aid for such highways and an abandonment of the past extravagant and wasteful outlays for the so-called "state roads." Past legislatures have appropriated large sums for such state roads. The last legislature switched a bit, and provided that a portion of the share should be borne by the county. The result has been that of the $110,000 appropriation but $2,000 has been expended. The county authorities have refused to make appropriations for their share, claiming the proposed roads were not of sufficient importance. Under the bill the counties may expend their money in their own way without scheme or system, but no state aid shall be rendered or they may place the road building for any particular highway or part of highway under the state as directed by the proposed law, and in that event the state will pay half of the cost of the road.

Considerable satisfaction has been expressed by the local automobilists over the act of congress in appropriating $50,000 for the road to Mount Tacoma. The sum is to be expended entirely within the reservation, which commences about twenty-five miles from the snow line. The government has been working on this road for two years, and is now expending the last of a $30,000 appropriation. To connect with the road being built by the government Pierce county will construct a highway through to the boundary of the reservation.

An automobile bill is in process of formation which contains some startling features, and which it is the intention to spring on the next legislature. The main features are holding the car liable for any fine that may be assessed against its driver, and that the license number shall be painted on the body of the car. It is proposed to make the fine a very heavy one, with $100 as the minimum and $1,000 as the maximum. This comes pretty near being "luny" legislation. The bill is undoubtedly the result of the recent flagrant violations of the existing state law.

There is hardly any question but that the next legislature will do something in automobile legislation, but it is doubtful if it will be of any such character. The present state law, which prevents municipalities from enacting automobile ordinances, is very unsatisfactory, and something new will undoubtedly take its place.

The Seattle automobilists are up in arms against County Commissioner Dan Abraham, who has placed four-inch planks across the Spokane avenue bridge, thus preventing driving faster than a walk. In doing this the commissioner has taken the law entirely into his own hands. It is true that there have been some very aggravating cases of fast driving in this city, and a number

of drivers have been brought into court and fined. It is probably due to the notoriety of these cases that has led Abraham to spoil one of the best drives in the city. It is also a case of short-sightedness, as the road is now in a somewhat dangerous condition. The county authorities will undoubtedly rescind Abraham's action, as it will be liable for damages in case any accident occurs that can be traced to the planks.

QUAKER CITY'S LATEST FRANCHISE SENSATION.

PHILADELPHIA, June 23.—City Solicitor Kinsey, who was asked for an opinion as to the legal status of the People's Vehicle Company, in the interest of which concern an ordinance was recently introduced into councils, asking for the exclusive privilege of operating automobile omnibuses over half a dozen routes, including many of the most prominent streets, has decided against the company. He finds that councils have no right to grant such an all-embracing franchise; that the state legislature alone has cognizance.

Thus has a quiet little steal been frustrated. But it is extremely doubtful that the snake would have been scotched had it not been for the fact that the Auto Transit Company, which had already taken out licenses to operate twenty vehicles, entered objections on the ground that the passage of the ordinance would not only drive it off Broad and Diamond streets, which had been selected for its first venture, but would keep it and any similar concern off those streets for twenty-five years to come.

And the Highway Committee of Councils had already reported the bill favorably, after a cursory examination, and mainly on the ground that the People's company offered a reduced rate to school children during specified hours. Indeed, the bill had been ordered printed when cries of "Grab!" began to be heard. It also developed that the franchises asked for would even block the Rapid Transit Company from several of the streets on the routes, and that made the committee sit up and take notice. Then it was that the city solicitor was called on for his opinion.

TOLEDO COUNCILMAN WANTS CAR FENDERS.

TOLEDO, O., June 23.—Councilman Leroux, of this city, has an original idea as to the needs of automobiles and of the best way to eliminate or reduce to the minimum all possibility of accidents. He has been working for some time past on an ordinance which he will shortly introduce into council which will require every machine to carry a net fender. His ordinance will also place the maximum speed limit at ten miles an hour and require that every machine have a registered number attached.

The idea of Councilman Leroux originated with the announcement made recently that a couple of Toledoans had invented a net fender for automobiles which, when not in use, can be so folded as to be almost hidden and not to take to exceed six inches in front of the machine. Control of the fender is secured through a series of springs which, when released by the foot, throws the fender into place.

NEW JERSEY'S ROAD REPAIR FUND.

Under the new Frelinghuysen law, the State of New Jersey has added up to date about $11,000 to its treasury for the repairs of roads that have been injured by the passage of heavy cars equipped with chain and other treads on the tires. The revenue from the new registration law is to be used for the above purpose by the State Commissioner of Roads, who will proportion to each county the requisite amount of the fund required for the necessary repairs within the respective county limits.

Before the end of the year the Registration Bureau expects to collect $65,000 in fees. This indicates a profit to the State, as it is hardly likely that it will cost that amount of money to repair the roads of New Jersey for damage done by automobiles in that period of time.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Tours.

July 1-5...—Five Day Tour, Cleveland, O., to Mt. Clemens, Mich., Cleveland Automobile Club.
July 10...—Buffalo, N. Y., Orphans' Day, Automobile Club of Buffalo.
July 12-26—Annual A. A. A. Tour, Chicago to Bretton Woods, N. H., Rules for the Glidden Trophy operative from Buffalo.
July 24-Aug. 2—New York to Boston and Bretton Woods, N. H., and return to Boston. (Will meet Glidden Tourists at Bretton Woods.) Entries with W. J. Morgan, New York, before July 20.
July 26-Aug. 2—Boston to Bretton Woods and Return, Bay State Automobile Association. (Will meet Glidden Tourists at Bretton Woods.)
Aug. 22-25—Asbury Park, N. J., Automobile Carnival.
Sept.....—500-Mile Endurance Test, Grand Rapids (Mich.) Automobile Club. (Date to be announced later.)
Oct. 1-2...—St. Louis, Mo., Automobile Parade and Carnival. St. Louis Automobile Club.

Race Meets and Hill Climbs.

June 30...—Race Meet, Belmont Track, Philadelphia Automobile Association. Entries to R. M. Lacock, Turf Club, 1421 Walnut street, Philadelphia.
July 4....—Race Meet, Newark, N. J., Waverley Track, New Jersey Automobile and Motor Club.
July 3-4...—Chicago Harlem Track, Race Meet, Western Automobile Racing Association.
July 4....—Wilmington, N. C., Races at Wrightsrill Beach, Wilmington Automobile Club.
Sept.....—200-Mile Road Race, for the Farson Cup, Chicago Automobile Club. (Date and course to be announced.)
Sept. 2...—100-Mile Road Race, on 25-Mile Circuit in Monroe County, N. Y. Rochester Automobile Club and New York State Automobile Association.
Sept. 22..—American Elimination Trials for Vanderbilt Cup Race. (Long Island Course probably.)
Oct. 6....—Vanderbilt Cup Race American Automobile Association.

Motorcycle Tours and Contests.

July 3-7..—Annual Endurance Run and Meet, Federation American Motorcyclists, Rochester, N. Y.
July 4...—Tour to Rochester, N. Y., New York Motorcycle Club.

FOREIGN.

Shows.

Sept. 1-8..—Canada International Exhibition. St. John. New Brunswick.
Oct. 5-14.—Leipzig (Germany) Exhibition, Krystall Palast.
Nov. 1....—New Zealand International Exhibition opens at Christchurch.
Nov. 1-16.—Berlin (Germany) Automobile Exhibition..
Nov. 15-24—London, Olympia Motor Show.
Nov. 23-Dec. 1—London, Stanley Show, Agricultural Hall.

Races, Etc.

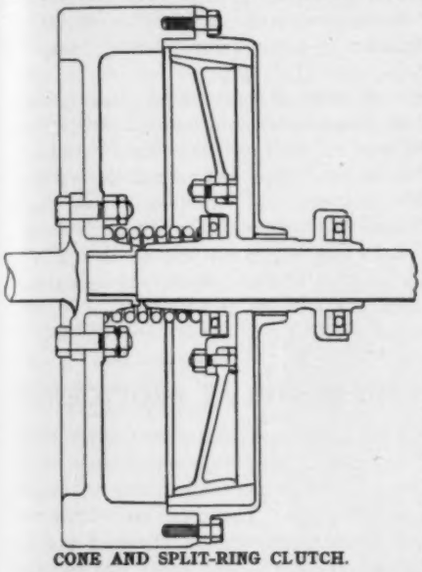
July 8....—International Cup Race for Motorcyclists, Cesky Club Motorcyclistu of Austria.
July 15....—Suze-Mont Cenis Hill Climb (Italy). Automobile Club of Turin.
Aug. 1-15—Circuit des Ardennes (Belgium).
Aug. 9-12—Malchamps (France) Hill Climb Tests.
Aug. 15-16—Ventoux (France) Automobile Meeting.
Aug. 14-19—Ostend (Belgium) Meet.
Aug. 18...—Liedekerke Cup Race.
Aug. 23...—Semmering Hill Climb.
Aug. 27-Sept. 2—Brescia (Italy) Automobile Meeting.
Sept. 3...—Auvergne Cup Race, France.
Sept. 27...—Tourist Trophy Race, Isle of Man, A. C. of Great Britain.
Oct. 7...—Chateau Thierry (France) Hill Climb.
Oct. 23...—Gaillon (France) Hill Climb.

Motor Boat Races.

June 28-29—Kiel (Germany) Motor Boat Races.
July 1....—Maison Lafitte (France) Motor Boat Races.
July 8....—Le Coupé Dubonnet (France) Motor Boat Races.
Aug. 6....—Motor Boat Race on the Rhone (France).
Aug. 9....—British International Cup Motor Boat Race.
Aug. 20-23—Ostende (Belgium) Motor Boat Races. Dover to Ostende.
Sept. 16...—Juvisy (France) Motor Boat Meeting.

FRICTION CLUTCHES AND THEIR FUNCTIONS.—I

BECAUSE the gasoline engine of an automobile must be allowed to run free—that is, without propelling the car—at certain times when it is not convenient or practicable to place the transmission gears in the neutral or non-driving position, a device known as a clutch is employed. The clutch consists of two members adapted to be pressed against each other so as to cause great friction. One of these members is carried on the rear end of the engine shaft, usually attached to or forming part of the flywheel, while the other is mounted on the forward end of a short shaft, known as the clutch shaft, which extends from the clutch to the gearbox. This refers to cars of the conventional motor-in-front type with a sliding gear transmission to the rear of the motor. Where a transmission of the planetary type is used the clutch is combined with the transmission, and this is also true of the individual clutch transmission, though even with these devices a clutch between the motor and transmission is sometimes fitted, when it is called the master clutch.



CONE AND SPLIT-RING CLUTCH.

Referring to the four-cylinder car, the problem to be solved is to provide a clutch between the motor and the transmission that can be readily manipulated by the driver of the car, that will take up the drive gradually and smoothly, without "jerking the car out from under the passengers," but that will hold firmly and transmit the maximum power of the motor when fully engaged. As a positive clutch or locking device, such, for instance, as a square shaft-end engaging in a square hole in the driven shaft, would be useless because it would take up the drive with a sudden jerk, friction is called into play, and all modern clutches used for starting the car consist of two friction surfaces, or sets of surfaces, pressed together by a spring or springs.

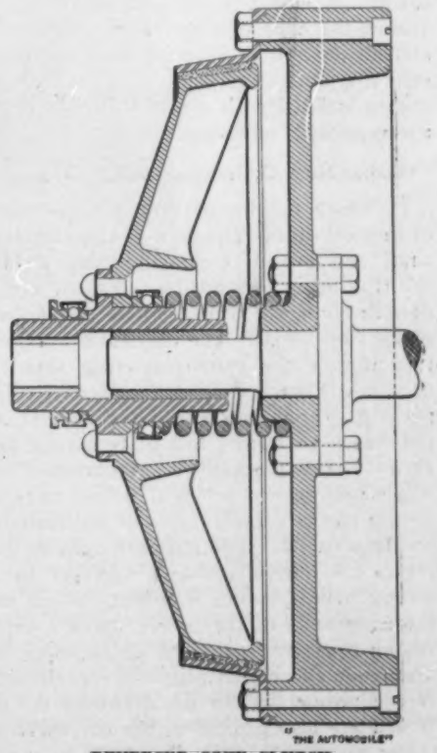
Construction of the Ordinary Cone Clutch.

The most commonly used clutch is the cone clutch, a type that has been used ever since auttomobiles came into use. In the ordinary cone clutch there is a recess formed in the flywheel of the rear side, and this recess is bored out tapering, the largest diameter outside. In some cases a casting of the requisite form is bolted to the wheel. The cone, so-called, is mounted on the end of the shaft to be driven, the hub of the cone sliding back and forth on the end of the shaft, but being forced to turn with the shaft by a feather or key, or else by having the end of the shaft squared and the hole in the hub squared to correspond. It will readily be seen that if the cone is slid on its shaft until it enters the tapered recess in the flywheel, and is forced into the recess with the requisite pressure, sufficient friction will be set up to transmit the turning effort of the engine to the driven shaft. The cone is slid on its shaft by means of a collar and fork arrangement. A collar formed integral with or attached to the hub of the cone is deeply grooved, and the ends of a fork project into the groove. By moving the fork back and forth, the cone can be moved whether it is turning or not; the fork is pivoted and is actuated by a pedal on the footboard. But it would be impossible for the driver to hold the clutch in engagement with his foot all the time the car was running, so a strong helical spring is used to press the cone home, the back end of the spring abutting against a collar or its equivalent fixed on the shaft. Thus the clutch is normally kept in engagement, the driver being required to exert himself only when it is necessary to withdraw the cone, when he presses or pushes forward the pedal and keeps his foot on it as long as he wants to keep the cone out. He can, when stopping the car, throw his change-speed gears into neutral position, and then let in his clutch without driving anything but the short section of shaft, usually called the clutch shaft, between the clutch and the gearbox.

The exact angle of the tapered parts is of the utmost importance because if the taper is too slight the cone will seize fast as soon as it is let in and, wedging into the recess, start the car with a sudden jerk that is not only very disconcerting to the occupants, but exceedingly hard on the engine and the power transmitting mechanism. But if the taper is too abrupt the clutch will slip excessively and will not hold securely. The cone is usually covered with leather to make its engagement smooth and to give a good grip; and the leather is often backed by springs, so that when the cone is gradually allowed to enter the recess the leather facing is at first pressed against the tapered bore and the friction is just sufficient to start the car gradually. When the clutch is allowed to go fully into engagement the springs are compressed into recesses.

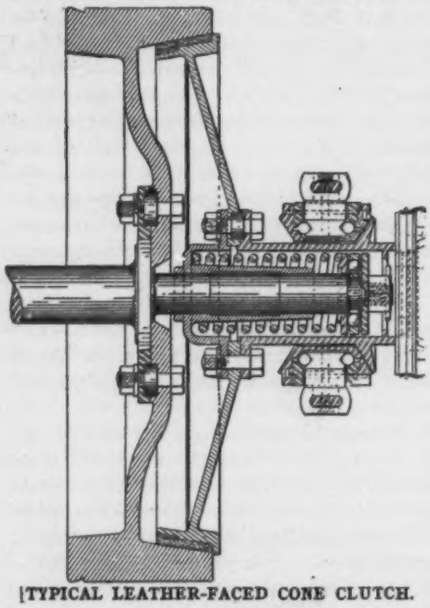
The Reversed Cone Clutch.

The form of the cone clutch is often varied by reversing the cone, making what is known as a reversed cone clutch. In this the internal cone is formed in a casting bolted to the flywheel, and the taper has its smallest diameter to the rear—the reverse of the previous arrangement. The cone is between the face of the flywheel and the internal member, and moves away from the flywheel when let in. The helical spring is placed between the wheel and the cone. One advantage of this arrangement is that when the clutch is engaged there is no end thrust on any of the bearings, as there is with most types of plain cone clutches.



REVERSED CONE CLUTCH.

The arrangements described are of the simplest type, and many of the details are varied in order to obtain minor advantages. For instance, the single helical spring on the shaft is sometimes omitted and two or more springs carried on studs parallel to the shaft. It is a common practice where cone clutches are used to employ ball bearings to take the thrust of the clutch spring when compressed by the pedal. In most clutches one of the shafts telescopes into the other, fitting into a bronze bushing which serves as a bearing and steadies and accurately centers the cone in the recess. Sometimes the leather clutch facing is omitted, and the clutch is then a metal - to - metal cone clutch.



TYPICAL LEATHER-FACED CONE CLUTCH.

Cone Clutch with Split Ring.

An interesting variation of the cone clutch consists of an inverted cone clutch with a split ring interposed between the two friction surfaces. The cone itself does not, therefore, come into contact with the casing, but causes the split ring to expand and set up the requisite friction with the casing. A wedge in the split prevents the ring from moving around the cone, and the same wedge is arranged to move up and fill the gap as it opens when the ring is expanded. This split ring clutch is made also with inverted cone. The clutch casing is filled with oil, and the parts are automatically lubricated.

Expanding Cylindrical Ring Clutch.

In another type of clutch there is a cylindrical drum attached to the driving shaft and a split expanding ring inside, the ring being expanded against the inner periphery of the drum when the driver presses his pedal. The illustration of this type shows the expanding ring idea as used in a French car. A four-armed steel plate *B* is rigidly secured to the end of the clutch shaft, and this plate carries the entire clutch mechanism. Fulcrumed on it are two curved levers *C* whose ends *D* are on pivots projecting from the ends of the split ring *L*. The opposite ends of the levers are normally drawn together by a strong helical spring *R*, which, acting on the long ends of the levers, gives a very strong pressure on the ring. In order to disengage the clutch toggle levers *M* and *N* are pivoted on the usual sliding collar *E* and are also pivoted to the curved levers at *F*. When the collar is pushed toward the clutch by means of a suitable collar and fork arrangement in connection with a pedal, the toggle arms force the ends *D* of the levers toward each other, thus withdrawing the ring from contact with the drum and allowing the two parts to run independent of one another. The friction surface of the split ring is covered with camel's-hair belting, which is said to be remarkably durable and unaffected by oil or water.

AUTOS PREDOMINATE ON JERSEY SHORE.

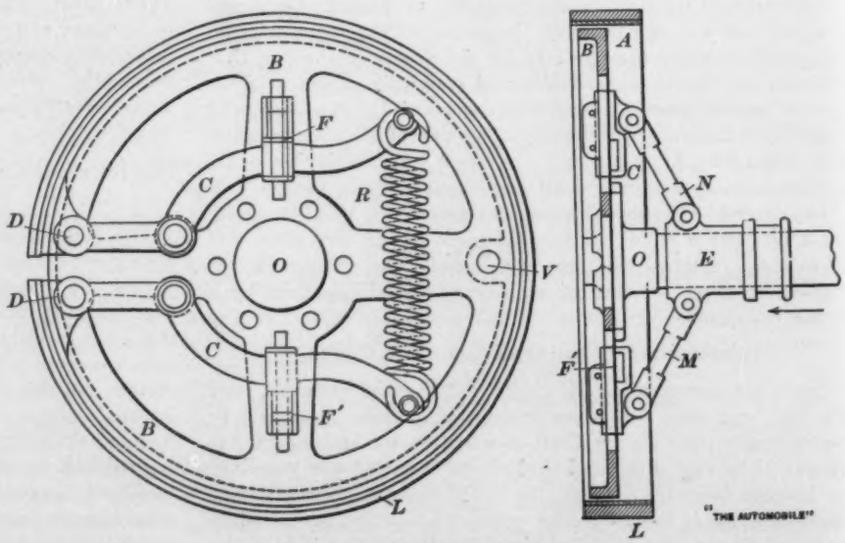
ASBURY PARK, N. J., June 25. — New Jersey's motor vehicle commissioner, J. B. R. Smith, testified to the importance of Monmouth county as an automobiling center by the appointment of three deputy commissioners for the county, one of whom, Charles R. Zacharias, is from Asbury Park. Mr. Zacharias keeps one of the largest automobile garages in the state, and is well known to every automobilist along the shore. One of the other deputies is located at Seabright, and the third is at Freehold, the county seat.

Every day brings additional cars to the New Jersey shore resorts, and the roads are full of them. One need only to spend an hour on the Ocean Drive between Long Branch and Asbury Park on a Sunday afternoon to see practically every make of automobile in the world.

Another vantage point for lovers of automobiles is at the railway stations in the late afternoons when the family bread-winner is due to arrive from the city. It used to be a collection of beautiful horses and handsome carriages that was seen at these places, but now the automobile predominates. At Red Bank, Long Branch, West End, Elberon, Deal, Allenhurst, and as far south as Belmar and Spring Lake the afternoon trip to the railway station in an automobile to meet husband, father or sweetheart is the feature of the day to the summer girl.

FOREIGN 'BUS EXPERIMENTS AT PROVIDENCE.

PROVIDENCE, June 25.—The American Locomotive Company has imported an automobile passenger 'bus from Switzerland and is conducting experiments to determine its adaptability to conditions of transportation in this city. The machine which was built by Adolph Saurer & Sons, at Arbon, has attracted a great deal of attention since its arrival a few days ago. The parts of the machine were shipped separately from the other side of the water and assembled at the company's work shops in this city. It is a large affair, about the size of an ordinary horse car, has a wheelbase of 12 feet, and will seat sixteen passengers. The machine weighs 7,500 pounds, has a 24-horsepower engine capable of developing a speed of fifteen miles an hour. The rear wheels are fitted with two tires each, placed side by side, which provides a broad base and is said to lessen the vibration. This multiple tire arrangement is being adopted by several manufacturers of heavy vehicles with good results. The company has been working out plans and designs for railway motor cars for some time, and it is expected that the actual manufacture of the cars will be commenced in a short time.



A FRENCH EXPANDING RING CLUTCH

EARLY SUMMER AUTOMOBILE CLUB NEWS

Recent Cross Walk Fatality Rouses Clevelanders.

CLEVELAND, O., June 25.—Members of the Cleveland Automobile Club are very much interested in the results of the investigation now going on regarding the cause of the accident which resulted in the death of Morris Osborne, son of a prominent coal man, which occurred near Wickliffe some two weeks ago. Young Osborne, who was 19 years of age, was riding on Euclid avenue with a friend, Walter Robinson, when the machine struck an obstruction and was overturned. Young Osborne was crushed to death under the car, while his companion was severely injured. The obstruction was in the shape of a bridge across the road, built by C. Merrill, a road supervisor of Lake County, and he claims that it was built for a crosswalk so that his family might cross the street without going in the mud. Automobilists, however, believe that this and other similar crosswalks have been built in that district to annoy automobilists. and to prevent them from making any kind of speed. The Cleveland Automobile Club took up the matter and hired an attorney to prosecute the case. No action will be taken, however, until the coroner has completed his inquest.

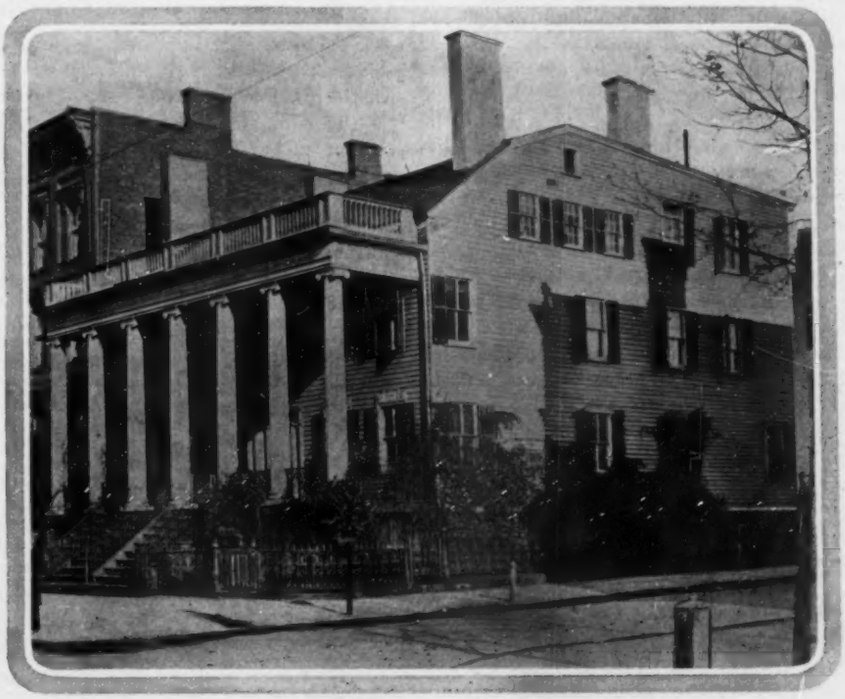
A feature which makes the case particularly aggravating to the members of the club is that only a short time before Secretary Goddard had sent a communication to the road supervisor complaining against the annoying crosswalks in that vicinity. Instead of leveling them off, it appears that another and higher one was constructed at this point, with the fatal results mentioned. The F. B. Stearns Company, which built the machine that Mr. Osborne was driving, will aid in the prosecution of the case if it is considered possible to make a case against the road supervisor. Mr. Stearns was a cousin and close friend of the unfortunate young driver.

The longest tour ever arranged by the Cleveland Automobile Club will be a five-day trip to Mt. Clemens, Mich., and return, starting Sunday, July 1. The schedule will be an easy one and the cars will travel singly, meeting only at agreed-upon points in the evening, this eliminating the annoyance of dust and the temptation for racing. On Sunday the members will make Toledo, 120 miles, and Monday they will run through Detroit to Mt. Clemens, remaining there all day Tuesday. The start for home will be made on Wednesday morning, July 4, stopping over night either at Detroit or Toledo, and returning to Cleveland Thursday. An invitation has been issued to all local owners, whether members of the club or not, to make the trip.

New Jersey A. C. Clubhouse to Be Put in Readiness.

NEWARK, N. J., June 26.—All necessary papers having been signed between the owners of the property and the officials of the New Jersey Automobile and Motor Club for the five-year lease of the Osborne mansion, which was described in last week's issue of THE AUTOMOBILE, the work of altering it into a first-class clubhouse will begin at once. The illustration published on this page will give an idea of the house as it now looks, and its fine location near the heart of the city will make it exceptionally attractive to members, both present and prospective.

Automobilists from New Jersey are being held up while traveling through Pennsylvania, by the wholesale. One Jerseyite was fined $36 for driving without a Pennsylvania license, and he had been in the State but an hour. Another, a Newarker, boldly traveled along and put up a fine front, telling every officer he met that he was on his way to the office of the commissioner of highways to get a license, and would then ask the nearest way to reach there. He went through the experience about a dozen times before he got out of the State.



NEW HOME OF THE NEW JERSEY AUTOMOBILE AND MOTOR CLUB AT NEWARK.

Auburn Club Will Greet Glidden Tourists.

AUBURN, N. Y., June 25.—Extensive preparations are being made by the Automobile Club of Auburn to entertain the Glidden tourists when they arrive in this city on July 12. At the last meeting of the club, President William F. Wait presided and ten new members were elected. A committee on entertainment, consisting of S. C. Tallman, Dr. George W. Whitney, and Wilbur B. Barnes, was appointed, with power to arrange matters. It was voted to make the Osborne House the official headquarters, where from 200 to 300 guests can be accommodated. George H. Leonard was deputed to make arrangements for the care and storage of cars of the contestants, without expense to them, and make arrangements for the supplies and repairs that may be required. The club's committee on road signs reported that 50 signs had been ordered, giving directions to tourists at the turning and corner points in Cayuga County on the route from Syracuse to Rochester, both east and west, and from Auburn to Ithaca.

Detroit Club's Activity in Road Building.

DETROIT, MICH., June 25.—To the members of the Detroit Automobile Club due credit should be awarded for their individual efforts in road building. To reach the new inland lake clubhouse of the club, it has been necessary, hitherto, to drive

to Pontiac, thence to Orchard Lake, and turn in around Pine Lake to the point where the building stands. As the drive was close to eleven miles from Detroit, it occurred to President E. S. George of the club that a short cut might be made by a cut from Bloomfield Hills, and he started to work on the plan. The farmers in the vicinity fell in with the scheme, and the property has been opened up with a roadway that will save six miles of the distance. Over $800 has been subscribed for construction work, and the road has been scraped and leveled the greater part of the way. Signs are being placed along the route, and work will continue all summer, under the charge of an executive committee of three, which employs a capable superintendent of construction.

Ohio's Bungled Law Causes All Sorts of Trouble.

COLUMBUS, O., June 26.—Resolutions condemning the persons guilty of the practice of throwing tacks, nails, broken glass, and other dangerous articles on the streets to stop scorching, have been adopted by the Columbus Automobile Club, which, while it has no sympathy for reckless auto driving, is strongly opposed to the use of unlawful methods to stop them, especially when the means employed works such injury to innocent parties.

The repeal of the old automobile law by which owners were required to take out city numbers has left the local authorities without means of identification in cases where the speed limit is violated, the new law not being enforced because of its bungled provisions. To catch the violators policemen are detailed to watch the thoroughfares they frequent, and during the past week there have been a number of arrests, one of the victims being Postmaster Harry Krumm, who, in fact, was the first one to get into the meshes of the law since the present crusade against auto scorching began. The inability of the police to control the situation led a number of people to take the matter in their own hands, and some of them went to such an extreme as to scatter tacks, nails, and broken glass over the streets. In some places ropes were stretched across the streets to bring the drivers to a stop. But the infliction of fines during the past week has had a salutary effect, and there is less speeding. The local automobile club is co-operating with the police in suppressing the speeding nuisance, but the members regard as outrageous the lawless means resorted to by many to stop the practice.

Buffalo Will Have an Orphans' Day, July 10.

BUFFALO, N. Y., June 25.—At the recent meeting of the board of directors of the Automobile Club of Buffalo, Tuesday, July 10, was the date set for the second annual automobile ride of the orphans of the city. Secretary Lewis hopes to have several hundred cars in line, and is making heroic efforts to secure the loan of cars for the occasion. Last year's Orphans' Day was very successful, and this year it is hoped to more than double the number on the tour.

The Automobile Club of Buffalo, of which Percy Pierce is a member, is preparing to give him a reception on his return home. His fellow members were greatly relieved to learn that the man with whose carriage his car collided in Germany, on the return from the Herkomer contest, was not fatally injured, as at first reported.

The club has experienced a phenomenal growth in membership so far this year, and especially during the last two months. At a meeting of the membership committee last week 24 applicants were elected to membership, bringing the total to between six and seven hundred.

A number of road signs have been donated to the club by President H. A. Meldrum. The first road to be covered this summer will be the one between Buffalo and Niagara Falls, and, while it is not necessary to place many direction signs over that route, several danger signs will be put at railroad and other crossings. The club will erect danger signs at the approaches to all steep grades in Erie and Niagara counties.

Chicago A. C. Ready to Build Its Clubhouse.

CHICAGO, June 25.—Delay in awarding contracts for the construction of the new clubhouse of the Chicago Automobile Club came to an end last week, when the deal was put through securing an additional plot of land, 26x93 feet, which was necessary to carry out the plans as submitted by the architect of the new building. Assured of the extra land, the auxiliary association of the club in charge of the matter can now go ahead with the work of construction. The plans call for a five-story structure front and three in the rear. The garage will be located in the three-story section and be separated from the main building by a fire wall.

In spite of the fact that the club vacated its Michigan avenue house on May 1, and is now temporarily occupying two rooms in the Fisher building, the membership list continues to swell. Almost 600 members are on the roll, and each week an average of three is added. By the time the new home of the club is completed it is expected there will be fully 1,000 members.

St. Louis Automobile Club Plans a Fall Carnival.

ST. LOUIS, Mo., June 25.—A big parade and a two days' carnival is to be held in this city next fall, if the present plans of the St. Louis Automobile Club are carried out. October 1 is the date set for the street parade, and every automobile owner in the city and vicinity will be invited to participate. The parade will be held in the evening, as will the display of the following day, when a battle of flowers will be arranged as a climax for the occasion. The recent success of the automobile race meet run by the club at the old fair-grounds has awakened much interest in automobiling circles.

There is every probability of a State automobile association being formed on July 8, at the banquet to be given by the Kansas City Automobile Club in that city. President A. B. Lambert, of the St. Louis Automobile Club, Attorney-General Hadley, and Alexander Euston will be among the speakers.

CLUB DOINGS IN GENERAL.

WILMINGTON, N. C.—Automobile races on the Wrightsville Beach at low tide will be run on July 4, by the Wilmington Automobile Club, just organized. Two events are on the program, one for runabouts and one for touring cars.

WORCESTER, MASS.—President J. P. Coghlin, of the Worcester Automobile Club, has come out strongly in favor of improving Dead Horse Hill, so that climbing contests may be held annually on it in the future that will be national in character. It is proposed to widen the course, and the club will present the matter to the various manufacturers' associations for their consideration.

MINNEAPOLIS, MINN.—Twelve new members were elected at the last meeting of the board of trustees. The club sent a representative to the State road convention, which was in session at Duluth the middle of the present month. The object of the convention was to promote the building of a first-class highway from St. Paul to Duluth. The club has issued skeleton maps showing selected runs in and about the country surrounding Minneapolis, ranging from 25 to 150 miles.

ROCHESTER, N. Y.—Chilly weather on June 23 and heavy, threatening clouds were responsible for the postponement of the opening of Genesee Valley Park with a series of gymkhana sports under the auspices of the Rochester Automobile Club, until July 7. The archery contest was held during the morning, as scheduled, but at noon the weather became so threatening that the park committee deemed it advisable to postpone the celebration until the date mentioned.

MR. EDGE ON SIX CYLINDERS.

Editor THE AUTOMOBILE:

[337.]—In your issue of May 31, I notice an article by E. R. Thomas who gives his reasons for discontinuing to make six-cylinder cars. As a believer in and a successful manufacturer of the six-cylinder Napier, may I be allowed in your paper to take up point by point Mr. Thomas' reasons for discontinuing the six-cylinder principle? I do so because I would like to see the English-speaking people get the full advantage from the six-cylinder principle, of which my own firm—The Napier—are reaping a very great advantage at the moment.

As you may remember, we introduced the six-cylinder principle some three years ago and to-day we have a factory employing over 1,000 men turning out nothing but six-cylinder cars of two models—the 40-horsepower and the 60-horsepower. We are getting out, on an average, ten a week now and hope to do for next year between fifteen and twenty per week. These are all big and expensive cars, and if we could make smaller cars we could very easily treble our output. France, Germany and Italy are all now buying regularly from us under firm business contracts.

We, ourselves, had many difficulties when commencing with the six-cylinder principle, to make it a thoroughly commercial success. To-day the six-cylinder engine is running with greater satisfaction in the hands of the ordinary user than four cylinders of equal horsepower. This is speaking generally. Now to deal with Mr. Thomas' points:

(1) He says the torque and vibration is less with six cylinders. I agree with him, but when he says this advantage is not perceptible when on the road, I cannot agree with him. Ask any independent person who has tried two perfect cars—one a four-cylinder and the other a six-cylinder. There cannot be any comparison. With a six-cylinder you do not know you are on an explosive engine, on the four-cylinder, when the engine speed gets a bit slow, you feel every impulse.

(2) Mr. Thomas says it is obvious that six-cylinders weigh more than four-cylinders. That is perfectly correct, but he omits to state that if you require an engine to give a given power that it requires six smaller cylinders than a four-cylinder engine does and in practice the actual weights are as follows:

40-horsepower six-cylinder Napier giving 48-horsepower on the brake, weighs complete with flywheel, carbureter, etc., 608 pounds.

40-horsepower four-cylinder Napier giving 49-horsepower on the brake, weighs complete with flywheel, carbureter, etc., 617 pounds.

(3) He still assumes that the six-cylinder engine is heavier than the four, and therefore puts more weight on the front axle. As his first assumption is incorrect as I have proved, it falls to the ground, but outside this he knows quite as well as I do that the question of the amount of weight on the front wheels can be easily governed by the position of the front axle.

It is also incorrect to say that a car steers best with a small amount of weight on the front wheel. As a matter of fact racing cars which steer better than any other, if correctly designed, have very frequently nearly two-thirds of their total weight on the front axle and then with this weight so placed, I speak from experience, I find the steering is better than that with very light weight on the front wheel and a very large amount of weight on the back axle.

(4) Mr. Thomas states that the six-cylinder engine requires 10 or more inches more longitudinal space from the dash. This I find in practice is incorrect. Our 5-inch bore four-cylinder engine is equivalent to our 4-inch bore six-cylinder engine in horsepower, and the total diameter of cylinders is 20 inches in the case of the four-cylinder and 24 inches in the case of the six. Allowing, however, for a few other differences, I find that in practice the six-cylinder engine of the same horsepower, is 5½ inches longer than the four.

(5) Mr. Thomas says that six cylinders of equal piston area will develop less power than four. This is not my experience of the Napier. With six 4-inch cylinders, 4-inch stroke, we have developed 52 horsepower. The total cubic capacity of the cylinders being 301 inches, can Mr. Thomas point to any four-cylinder engine giving equal power with the same cubic capacity? I think not.

If multiplication of cylinders is bad for efficiency, why is it that to-day the two fastest cars in the world have six and eight cylinders respectively, when these cars have to be built under a limit of weight? If Mr. Thomas' theories are correct a large four-cylinder engine would give a faster car.

As to the question of six-cylinder giving trouble, I agree that theoretically this should be so, but users know from practice that apparently the constant and smooth turning motion of the six-cylinder does actually cause less trouble than the more irregular four-cylinder engine; just in the same way that in the olden days when we used two-cylinder engines people used to say four cylinders were more complicated and gave more trouble, but in practice four cylinders gave less trouble than the two, and six even less than four.

I agree that the timing of the six-cylinder engine is more difficult than the four but this is a question for the factory; it does not interest the user, neither does the question of the wiring, the lubrication, the cooling or getting the proper mixture and distribution of gas from the carbureter. These are all points that the manufacturer has to look to, and if he is unable to cope with these difficulties then he does no business; but if he does cope with them he certainly gives the user a more perfect car if it has six cylinders than if it has four.

In regard to the question of six cylinders not being economical in consumption of gasoline, I enclose you herewith copy of the certificate obtained from the Automobile Club of Great Britain and Ireland in regard to Petrol Consumption, from which you will see nearly nineteen miles to the gallon was run on a Napier 4-inch six-cylinder car, and I enclose you copy of Farraday House test, by which you will see the horsepower developed by this engine was very considerable over 40-horsepower. In a recent gasoline consumption test held in America I did not see that engines of similar horsepower ran with equally small consumption even though they had four cylinder engines.

As to the suggestion that the six-cylinder car is a "fad," I cannot help thinking that Mr. Thomas has become disheartened with his manufacturing difficulties too soon. I felt just the same at one time, but every time I went for a ride on a six-cylinder Napier, I felt that once a user had been for a ride on a six-cylinder he would not listen to anyone who told him of all the difficulties one had in the factory to perfect the six-cylinder, and now having perfected the six-cylinder, I seriously commend every enterprising manufacturer who wants to build a powerful car to really realize and understand about the merits of six-cylinder engines in England.

I have thrown open the Napier factory to any English manufacturer who wants to see what we are doing, as I am more than anxious to see the English-speaking race lead the world in automobile construction. Naturally, I prefer a British firm to lead, but after a British firm I would like to see an American in preference to a foreigner, and I hope if there are any American manufacturers coming to London this year they will pay a visit to the Napier factory, so that they can see how we have succeeded in making six-cylinder Napiers a commercial success, reasonable in price and of great pleasure and satisfaction to hundreds of users who own the cars at the present time.

S. F. EDGE.

London, Eng., June 13.

THE REAL JUGGERNAUT OF THE STREETS.

"Yes, automobiles are a bit dangerous at street crossings," said the traffic policeman, "but the biggest is not to be compared for danger to a drunken driver, driving a felt shod horse, harnessed to a rubber tired hansom, with the lights out. Even the quietest automobiles make some noise, but the combination I have just named gives the pedestrian no warning whatever. There are more narrow escapes from horse-propelled vehicles on Broadway than from automobiles. Of course, when an auto knocks a man down the papers make a sensation of it, but five men are hurt by horse-drawn vehicles to one by the horseless kind."—*New York Sun.*

MARYLAND MUNICIPAL DIGNITARIES IN A RAMBLER.

Mayor Timanus of Baltimore on right in the tonneau and ex-Mayor Whyte of Cumberland on the left.

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H. M. SWETLAND, President

EDITORIAL DEPARTMENT:
A. G. BATCHELDER, Managing Editor H. F. DONALDSON, Engineering Editor
R. F. KELSEY, Associate Editor HOWARD GREENE, Assistant

BUSINESS DEPARTMENT:
A. B. SWETLAND, Business Manager
L. R. SMITH P. M. RICHARDS B. FRANK BARNETT
W. I. RALPH, 1034 Old South Building, Boston, Mass.
C. H. GURNETT, H. H. GILL, 625 Monadnock Block, Chicago, Ill.

Cable Address - - - - Autoland, New York
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Courtesy to Others in Driving. In automobiling, whether around one's own locality or on tour, there should be a punctilious observance of the rules of the road. Among drivers of good road horses there is an unwritten code, any departure from which, without good cause, is regarded as a distinct mark of boorishness or illbreeding. Either on these grounds or the more selfish one of policy, the automobilist cannot afford to be outdone by the horseman in the practice of courtesy in driving. It is unfortunately the fact that an automobilist often lays himself open to serious criticism, if nothing worse, by violating a rule or a custom that he is totally ignorant of—his intentions are as good as those of his critics; it is his knowledge of what to do and when to do it that is deficient.

In automobiling there are two distinct functions which the driver must perform. One is the management of the automobile as a machine, and the other is the handling of the automobile as a vehicle, using the public roads in common with all others. This dual responsibility should never be lost sight of even in any emergency. Incompetent handling of the car as a machine may result in nothing worse than an inexpensive replacement of some component, while careless driving may result in a heavy bill of damages assessed by an unsympathetic jury.

One of the commonest errors of automobile driving is to "cut in" ahead of a vehicle going in the same direction, so that the horse-driver must swerve from his course to avoid collision. This is a gross violation of road courtesy, and may easily occasion a serious accident. Another equally common infraction is cutting a corner when making a left turn on a road that is much traveled; and especially when the turn is made from an inferior road or street into a main thoroughfare. All vehicles on main streets and roads have the right of way. Turning to the right artistically, with a car of long wheelbase, requires a considerable amount of skill so as not to get off the right side of the road. Other frequently noted violations are, slowing down or stopping suddenly without signaling to those who are following, and also stopping for repairs or adjustments in the middle of the road. A car should always be driven close to the curb or road line before a voluntary stop is made. And when stopping for any length of time on a country road, the car should be pushed onto the roadside if surface conditions permit.

Many automobilists were and are horsemen, and almost unconsciously they do the right thing even when there is not much time to think about it. Some, however, have had no practice in riding or driving, perhaps not even with a bicycle, and have not given the subject any serious attention. To such, who have the opportunity, we suggest the plan of driving out with some owner of a good horse and noting the "how" and the "when."

All horse drivers are not courteous and considerate of the rights of other road users. But whether or not, those who drive horses for pleasure usually know the rules of the road even if they do not observe them, and they certainly can appreciate that knowledge in others.

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Hotel Men Will Aid Persecuted Automobilists. One of the direct results of over-zealous officialism in the alleged enforcement of speed laws on Long Island, has been the formation of an organization of prominent hotel men, whose business is being greatly interfered with by the lynx-eyed Javerts of the highways. Country hotels are the necessary adjuncts to pleasurable touring, but automobilists are very apt to shun the districts whose officials make a specialty of holding up every passing car for an alleged infraction of the law, causing an endless chain of inconvenience to the owner, even though it may be proven he was not exceeding the speed limit. The object of the new hotel men's organization is to encourage the use of the southern Long Island roads by autoists, and to protect and defend those who are unjustly accused of speeding. It will thus be seen that the inherent right of defense from persecution is still a strong American characteristic, and "mine host" may become a powerful factor in shaping automobile legislation of the future. At any rate, since the formation of the hotel men's association there has been a sudden cessation of activities on the part of local officials in southern Long Island townships.

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Burden of the New Jersey Law. The new statute known as the Freylinghuysen law which goes into effect in New Jersey July 1, promises to become a two-edged sword. There are thousands of automobilists who, rather than submit to the exacting conditions imposed, may give New Jersey the go-by this summer. Already there are murmurings from proprietors of hotels of loss in patronage, and so far there have been under 4,000 automobiles registered in the state this year, against a total of 17,000 registered under the old law. The best way to get rid of a bad law is to have its effects react on the commonwealth that imposes it, and New Jersey will come in for little sympathy should the law prove to be a boomerang, as it now promises to be. There is an old adage which says you can lead a horse to water but can't make him drink, which may be applied to the automobilist who is a non-resident. A season or two of "splendid isolation" might bring the legislators of the state to their senses.

SZISZ WINS THE GRAND PRIX.

By A. G. BATCHELDER.

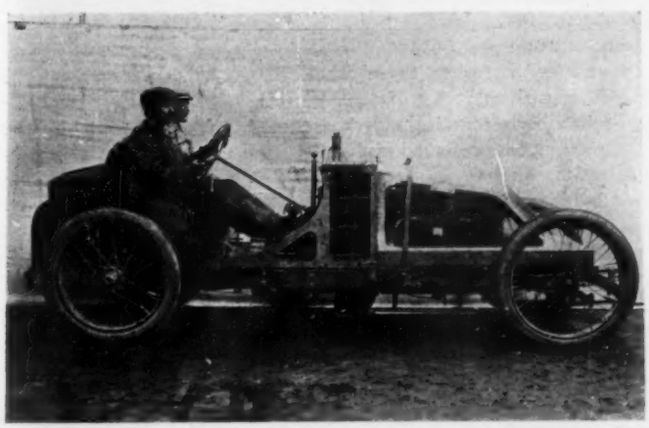
Special Cable Report to THE AUTOMOBILE.

LE MANS, FRANCE, June 27.—Francois Szisz, on a 110-horsepower Renault, won the Grand Prix to-day. Time, 12h. 14m. 7s.; Nazarro second, 12h., 46m., 26s.; Clement third, 12h., 49m., 46s.; Barillier fourth, 13h., 53m.; Lancia fifth, Heath sixth, Baras seventh. Shepherd, smashed wire wheels. Hemery out after first round. Rigoly dropped out. Teste broke leg in accident.

How the Race Was Started.

PONT-DE-GENNE, GRAND STAND, LA SARTHE, FRANCE, June 26.—The sun rises early these June days, but an enormous crowd to-day vies with it for early-rising honors, and jams the triangular circuit, invades the stands, and disappears in the adjoining fields to reach some favorable vantage ground along the course. At a quarter to six a brief order "No more cars admitted" is given. The companies of infantry brush the tarred road every 100 yards on the 103 kilometers of the triangle, and red and blue garbed soldiers with guns and bayonets flashing see that no one strides across the racing way.

The monsters are in line for the start, some roaring tremendously from time to time—the DeDietrich, No. 1, first, with



SZISZ ON HIS 110-HORSEPOWER WINNING RENAULT

Driver Gabriel carelessly leaning against the big bonnet, behind him Lancia on his Fiat makes demonstrative jests with a group of four or five admirers, his big, jolly face red with excitement. He wears a short sweater and a pair of overalls. Suddenly the first thirteen cars are simultaneously cranked, and their imposing voices are heard like a band of drums. Gabriel reaches the starting line. The starter and a judge give him his parting injunctions, he nods his head and adjusts his goggles, his machine aquiver with excitement of suppressed energy. Little Gabriel maneuvers his clutch lever, places his foot on the pedal and is given the count. *"Etes-vous-pret?" "Oui." "Dix, neuf, huit, sept, six, cinq, quartre, trois, deux, un"*—bang, cracks the pistol, than a metallic sound, that decreasing like a sigh, fills the air, a little gray smoke sweeps the brown road, and in a twinkle a small swift-moving dot ascends the hill and is lost in the distance. Another, which leaves in a storm of explosions, is already pursuing the first, and another and a fourth and a fifth—Lancia, Szisz, Hemery, Barras, etc.

At eleven o'clock Szisz in his Renault appeared to be winning, in fantastic fashion, the first stage of the race. He passed the stand for the fifth time like a shadow. He overtook Gabriel and Lancia together in the second lap between Cherre and Lamnay, after passing LaFerte-Bernard, before reaching the Vibraye forest. Barras was coming fast behind, and Albert Clement was close to Szisz's heels. Szisz won the first stage of the race, his speed averaging close to 70 miles an hour. His time for the 619 kilometers (375 miles) was 5:45:30 2-5. A. C. Clement in a Clement-Bayard was second, time 6:11:40; Nazarro in a Fiat, third, time 6:26:53; Shepard, the American amateur driver, in a Hotchkiss, fourth, time 6:30:45. Sixteen cars were officially classified as finishing the first day's stage of the race.

Two accidents occurred the first day. Fabry, driving his 140-horsepower Itala, collided with a wall near Connere, and his machine was completely disabled but neither he nor his mechanician was injured. Le Blon, driving a 135-horsepower Hotchkiss, ran into a ditch, going a 75 mile an hour gait, and upset without sustaining personal injury. The car was wrecked.

Gordon-Bennett Not to Be Revived.

The international delegates present voted not to revive the Gordon-Bennett International Cup, France, Germany, Belgium and Italy voting against and England for the revival.

MORE VANDERBILT ENTRIES.

As July 1, the date for closing the entry lists for the Vanderbilt Cup race elimination trials, approaches, the number of cars aspiring to the honor of racing for the cup increases. There are now entered nine American candidates—two Thomas Flyers, two Frayer-Millers, a Haynes, an Oldsmobile, a Matheson, a Pope-Toledo, and a B. L. M. One of the Thomas cars will be driven by C. A. Coey, of Chicago, and the other by M. Roberts, who drove the Thomas in last year's eliminations. The Haynes will be driven by Frank Sweigert, the Oldsmobile by Ernest D. Keeler, and one of the Frayer-Miller cars by Lee Frayer. Entries are expected of the Wayne, Christie, and Maxwell cars, and among the reported possibilities are a third Thomas, a White steam car, and a Royal Tourist.

GLIDDEN ENTRY LIST SWELLS.

Eighteen entries for the Glidden Tour had been received by Superintendent Tucker up to going to press. Of these twelve have already been published in THE AUTOMOBILE, and the later entries are as follows:

No. 13.—Walter C. White, c. o. White Sewing Machine Co., Rose Bldg., Cleveland, Ohio. Buffalo to Breton Woods. Will not contest for Glidden Trophy. White car of 18 h.p. Two in party. Cleveland Automobile Club. Will run as Pilot.

No. 14.—Philip S. Flinn, 320 Diamond Street, Pittsburg, Pa. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Pierce Arrow car of 32 h.p. Three in party. Pittsburg Automobile Club.

No. 15.—William E. Wright, c. o. Knox Automobile Co., Springfield, Mass. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Knox car of 35-40 h.p. Five in party. Springfield Automobile Club.

No. 16.—Robert B. Craufurd. Hotel Marie Antoinette, New York City. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Stevens-Duryea car of 50 h.p. Five in party. Automobile Club of America.

No. 17.—Henry Paulman, 1321 Michigan Ave., Chicago, Ill. Chicago to Bretton Woods. Will contest for Glidden Trophy. Pierce Great Arrow car of 40-45 h.p. Five in party. Chicago Automobile Club.

No. 18.—Hart D. Newman, New Orleans, La. Buffalo to Bretton Woods. Will contest for Glidden Trophy. Packard car of 24 h.p. Four in party. New Orleans Automobile Club.

WAR DEPARTMENT BUYS AUTOS.

WASHINGTON, D. C., June 26.—Quartermaster General Humphries has ordered for immediate delivery two White steamers, a Royal tourist and a Franklin light truck for the use of the United States Army during summer manouvers. General Grant will use the Royal Tourist at Mount Gretna, Pa., and the White steamers will be used by the commanding generals at Fort Riley, Kan., and Indianapolis. The Franklin truck will be used by the quartermaster at Mount Gretna, Pa. Commanding generals have been requested to make reports to the War Department on the merits and demerits of cars used by them. It is thought the action of the department is the forerunner of an extensive use of automobiles in the army.

PERCY PIERCE SAILS FOR HOME.

Cablegrams received by the George N. Pierce Company, Buffalo, state that Percy Pierce sailed for home June 27, and will enter the Glidden tour. Advices received the latter part of last week showed that the early reports of a fatality in his collision on the return from the Herkomer tour were unfounded.

HENRY FORD HAS HIS SAY.

Considerable talk has been created by the recent action of Judge Lacombe in New York, who declared John B. Trevor in contempt of court because he bought an unlicensed foreign car after he had agreed to the validity of the Selden patent. The validity of the claims of the Selden patent are being fought in the courts by the Ford Motor Company, which makes the assertion that until this suit is decided in the courts, no case can be made against anyone else unless he invites it. That the Ford Motor Company is determined to contest every inch of the ground with the Selden patent owners, and that Ford neither will ask nor give quarter, is evidenced by the following pointed statements given out by Henry Ford:

"The Selden people, in line with their policy of intimidation, evidently wish to make it appear that the individual buyer of an unlicensed car is menaced by this decision, which decision, they would have the public believe, has a bearing on the validity of the Selden patent. A casual review of the situation will show that this conviction for contempt was only what might have been expected under the circumstances, and has no bearing whatever on the validity of the Selden claims. As I understand it, Mr. Trevor had previously bought a foreign-made car through an unlicensed agent. Suit was instituted against him by the Selden people, and, rather than go to the expense and trouble to fight it, Mr. Trevor allowed a consent decree to issue against him—thereby tacitly admitting, so far as he personally was concerned, the validity of the Selden patent. He later purchased another car and, despite his previous action, repudiated the right of the A. L. A. M. to exact tribute in the form of royalty. In view of his previous action, this was clearly in contempt of the court to whose ruling he had assented, and the judge rightly so ruled.

"It has been a favorite method of the Selden people to institute friendly suits with some apparently belligerent individual who, after putting up a lame fight, finally confesses judgment. These so-called victories are always used by the A. L. A. M. as scarecrows to intimidate buyers. To one who is familiar with the peculiar tactics of the Selden people, Mr. Trevor's position in this matter looks dubious to say the least, and astute observers are likely to accuse him of bad faith in the matter.

"If there is any basis for the claims of Selden, the owners of that patent, the A. L. A. M., have a good chance to demonstrate it in the pending suit with the Ford Motor Company. Why do they not vigorously press that suit instead of taking advantage of every technicality to secure delays and otherwise impede the progress of the litigation in the very evident attempt to put the day of final decision afar off?

"If they must attack an individual, why not go after Mr. Thos. F. Ryan, who practically controls the Electric Vehicle Company, which concern gets three-fifths of the many thousands of dollars which some makers are paying in royalties. Only a few weeks ago I am informed, Mr. Ryan purchased an unlicensed car through the Mercedes Import Company, though the Smith & Mabley Company have been selling Mercedes for years and have paid many thousands of dollars to the licensed association.

"There are something like 135 manufacturers of automobiles in this country, of them, thirty-two or three, I believe, are included in the licensed association. Among the prominent foreign car builders who scoff at the claims of the Selden people and decline to pay tribute are the Mercedes, Panhard, Renault, Brasier, Leon Bollée, Mors, and the C. G. V.

"No buyer of a car need have any fear of being enjoined from buying or using any car that suits his fancy and his pocketbook until after the association has settled this patent suit with the Ford Motor Company in the courts. Men have been, and will be, convicted of contempt of court for as many offenses as there are courts and litigants, but we cannot see where such convictions will ever serve to prove the validity of a patent, or to interfere with the selling of automobiles."

FRAYER-MILLER STICKS TO COLUMBUS.

COLUMBUS, O., June 23.—Negotiations for the removal of the Oscar Lear Automobile Company, makers of the Frayer-Miller, from this city to Zanesville, are off, and the company will remain in this city. A site was to be given the company and $100,000 loaned it, and, in addition, a loan of $100,000 was to be made, which money was to be used in the construction of a large plant. Just as the contract was to be signed the local banks refused to assume the liability of the subscribers to the loan, and after two or three efforts to get the matter adjusted, the company abandoned the project.

POOR INDIANA STATISTICS.

INDIANAPOLIS, IND., June 25.—Through a number of errors, for which the manufacturers themselves are believed to be responsible, the figures compiled by State Statistician Joseph W. Stubbs on the automobile industry of the state have been found to be practically worthless. Several months ago the employees of the office began gathering data on the automobile industry, together with other industries, as they existed in Indiana in 1905. The figures have just been compiled, but the automobile industry, undoubtedly one of the most important in the state, appears practically insignificant alongside of some of the others.

Where automobiles should rank near the head, the data gathered shows that the industry ranks forty-first, and it cannot be known for at least another year the true rating of the automobile factories, the number of men they employ, or the capital invested. This is a disappointment to automobile manufacturers, as they have contended all along that their industry was one of the largest.

According to the figures, which have not yet generally been made public, there were eight factories in Indiana for the manufacturing of automobiles, and three for the manufacturing of accessories. The capital invested in these eight factories is represented as $1,140,509. The salaries paid out during the year amounted to $482,198, which were paid to 789 men. The value of the product is given at $1,595,302. The three manufacturers of bodies and parts are represented as having a capital stock of $53,495, with twenty-seven employees earning $14,242. The product is given at $42,300.

It has been found that some of the largest factories in the state are not represented under the head of automobile manufacturing, and much of the credit for the business goes to the horse-drawn vehicle industry. For instance, Studebaker's at South Bend, are given under the latter head, with no mention of automobiles, while the Columbia Electric Manufacturing Company at McCordsville appears under "Telephones." There is such a number of like errors that it will be practically impossible to straighten out in time for the 1905 report of the state statistician, which is about ready to go to press.

Only four automobile factories are credited to Indianapolis, one to Auburn and one to Kokomo. The Indianapolis factories had a capital stock of $810,060, employing 447 men at salaries amounting to $277,844. The product was valued at $797,652. There are now nine factories in Indianapolis, seven of which were in the city in 1905.

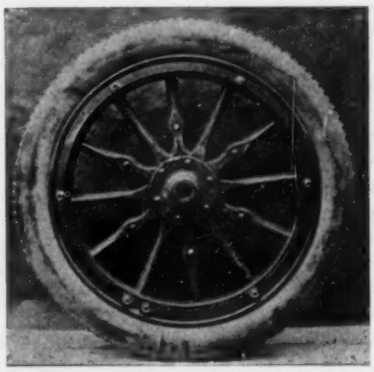
A NEWLY CONSTRUCTED CHICAGO PLANT.

The new three-story factory of the Holsman Automobile Company, of Chicago, has been completed, and the company has moved its machinery into the building. The structure is 50 x 250 feet,

three stories in height, and will enable the Holsman people to vastly increase their output. This concern has been manufacturing automobiles for four years, and has been running a night and day force in the old factory for the past year.

DETACHABLE RIMS FOR THE GRAND PRIX

PARIS, June 15.—An extremely interesting feature of the Grand Prix will be the use of detachable rims and tires by some of the competing cars. As the drivers and mechanics must do all their own work without outside assistance, manufacturers have looked for some easy method of changing tires, and the two devices described herewith have been adopted. Both these systems allow spare inflated tires to be carried on the car and replaced for a disabled tire in from one and a half to two minutes without the use of a pump or special tools.

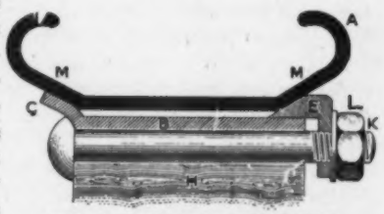


VINET DETACHABLE RIM.

The patent M. L. rim, which has been on the French market since the last Paris Salon, is sold by the Société des Jantes Amovibles M. L., of 112 rue Richelieu, Paris, and although patented abroad, is at present only to be found in London and Paris.

An ordinary wooden wheel may be converted, or the wheels may be specially constructed. On the outer edge of the road wheel are embedded six bolts projecting about three-quarters of an inch. The detachable rim, which is of steel, has the same flanged edges as an ordinary rim. Six projecting ears are riveted within the circumference of the rim and near its outer edge. Each of these ears is drilled to fit the bolts projecting from the face of the wheel. The tire is fixed on this rim, the air chamber inserted, and inflated exactly as an ordinary automobile wheel. The rim is then slid on the road wheel, the bolts on the wheel passing through the ears on the rim and held in position by nuts. Provision is made for the projecting valve by a notch cut in the wooden rim, and as a further security against creeping the ears are countersunk into the wooden and metal rims of the wheel. The surface of the rim coming in contact with the felloe consists of two steel rails machine finished, with a groove between them, in which are imbedded the nuts holding the valve on its seating and the bolts of the leather cover of which the air chamber rests. Being flush with the level of the rails, it is impossible for the bolts to work loose.

The Vinet rim will also be seen in the Grand Prix. M. Kepferer, of 24 rue de la Rochefoucault, Paris, is the only selling agent. As in the system just described, the Vinet consists of a double rim, one part being fixed on the wheel and the other bearing the tire being detachable. The flat steel rim *B* encircling the road wheel *H* carries on its interior edge a ridge *C*, against which is pressed one edge of the detachable rim *M M*. This latter has only to be slid on to the wheel, the diameter of the wheel being about four millimeters less than that of the rim in order to make the operation easy. Five or six projections on the detachable rim fit into indentations on the fixed rim, preventing one rim revolving on the other. The rim placed in position, a steel ring *E*, split to facilitate mounting and having one of its faces beveled to fit against the face of *M M*, is placed over the six projecting bolts on the wooden rim and held in position by nuts *L*. To dismount a tire it is only necessary to unscrew the nuts *L*, take off the split ring *E* and withdraw the rim and tire *M M*. A special short valve has to be employed, not projecting beyond the false rim *M M*. To inflate the tire it is necessary to dismount it. An improved model is now being made in which the fixed rim of wood and metal is pierced to allow of the passage of a prolongation of the valve, screwing into the valve embedded within the false rim. By this means it would not be necessary to dismount the rim to inflate the tires.

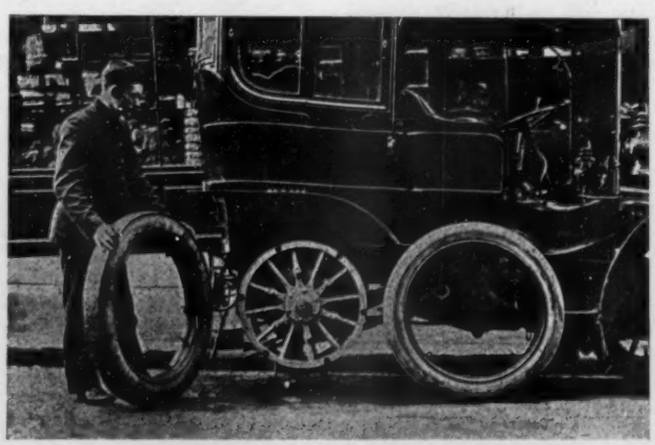


CROSS SECTION OF VINET RIM.

All the cars employing these rims in the Grand Prix race will carry two spare tires completely inflated. When a change is necessary the tire will be changed and dropped off at the first repair station and another taken on board. Valuable time will certainly be saved, and, seeing that seconds will probably decide the winning or losing of the race, one might at first suppose that all cars would be fitted with these wheels. The weight limit of 1,000 kilos, however, prevents several competitors from adopting them, and the private objections of drivers may be a determining factor in other cases.

Clément Bayard and Vulpés cars are certain to be fitted with either Vinet or M. L. rims, while other firms, having given them extensive trials but not having yet definitely decided, are Darracq, Renault, and Brasier. The Itala, to be driven by Baron de Caters, will stick to fixed rims, declares M. Henri Fournier.

In all previous big road races the most elaborate preparations have been made to keep good tires under the cars, and the scores of tire experts stationed at intervals around the course have often had a very important, though not fully appreciated, share in placing the cars at the finish. Stacks of tires, patent pumps, steel tanks of compressed air, the most ingenious tire tools and the pick of the tire men have been considered essential to a great road race, and the scene when a car dashed up to a tire depot to have tires changed was spirited; the tire men would rush out with sharp knives and with dexterous strokes cut the tires from the wheels, giving way instantly to another gang carrying new tires ready to apply. A third set of men would be ready with the hose connections from the air tanks, and in a short time the car would be again on its way. In the meantime the driver and his mechanic could take things as easily as their dispositions would permit. While a picturesque feature has been removed, the new arrangement will doubtless do much to develop a more convenient method of fastening tires.



THE M. L. RIM WITH TIRE REMOVED.

CHICAGO'S 100-MILE RELIABILITY RUN.

CHICAGO, June 25.—At a meeting of the Chicago Automobile Dealers' Association held last week it was definitely decided to hold a 100-mile reliability contest over the Elgin-Aurora course on some day between July 15 and August 1. The committee which will manage the test is J. F. Gunther, chairman; W. L. Githens and G. Bennett. Messrs. Guntehr, W. L. Githens and Thomas Hayes have inspected the century course and found it satisfactory. They also found it to be exactly 105 miles in length starting from the Auditorium Annex. Many signboards will be placed along the road in order that the contestants may not stray from the path. They will attend to this detail on their next trip.

City authorities contemplated removing the gasoline tanks beneath the alleys in the rear of garages along Michigan avenue, but an injunction has been filed, under the leadership of Orlando Weber, restraining the authorities from taking the step until the matter has been settled in court. Those who were represented in the injunction proceedings were Fred E. Dayton, Webb Jay and C. A. Coey & Co. The grounds for the injunction were based on the grounds that the alleys are not city property but private. The case was handled by Secretary S. S. Gorham of the A. A. A. and Attorney W. Jennings.

A large number of Chicagoans have already entered for the Glidden tour, among them being J. H. McDuffee, C. A. Coey, Charles Y. Young and N. H. VanSicklen. Mr. Coey will drive a Thomas Flyer, Mr. VanSicklen will have his Apperson, Mr. Knight is to steer his *Silent Knight* and Mr. McDuffee will be seen in a Stoddart-Dayton. The tour is exciting great interest in local club circles.

TRADE MATTERS IN PHILADELPHIA.

PHILADELPHIA, June 25.—The summer solstice is bringing with it the usual stagnation. "The Row" is quieter now than at any time during the past six months. Next year's models are already being looked for, and the Rambler, Cadillac and Pierce people are announcing the early appearance of their 1907 machines. It is a season of preparation, and repairs have been in order all along the row during the past fortnight. The big new garage of the Rambler, at 207-209 North Broad street, is expected to be under roof by August 15, and ready for business a month later.

Harry De Groat, who handled the Union bicycle in Philadelphia in the late '90s, has succeeded to the sales managership of the Philadelphia branch of Thomas B. Jeffery & Co. Harvey Coulbert, formerly with the Diamond Rubber Company, has also joined the Philadelphia Rambler forces.

The Rainier company has given up its establishment at 236 North Broad street, and the opening was immediately snapped up by the Diamond Motor Car Company, formerly of 2117-19 North Broad street, which has long been looking for a "Row" location. The latter concern handles the Cleveland and Jackson automobiles.

HOOSIER CAPITAL TO HAVE ORPHANS' DAY.

INDIANAPOLIS, June 18.—An orphans' day outing, similar to events of the kind given annually in New York, Boston and other Eastern cities, is being planned for this city by Cecil Gibson, of the Gibson-Short Cycle and Auto Company. It will be given some time in July, the date not having been set. There are half a dozen orphans' asylums in Indianapolis, containing about 500 orphans, and the plans will include giving every one of the unfortunate little folks an afternoon's ride in an up-to-date touring car. The trip will probably include a tour of the city, followed by a run to Broad Ripple and a few hours at White City, an amusement park, where the little folks will be the guests of the management. Everything possible will be done to make them have an enjoyable afternoon, and no expense will be spared to make the affair a pronounced success.

WESTON-MOTT PREPARING TO MOVE.

At Flint, Mich., on Wednesday, June 20, articles of incorporation of the Weston-Mott Company were signed. The company was organized with a capitalization of $500,000—$400,000 issued at once, and $100,000 to be retained in the treasury of the company; the present members of the Weston-Mott Company, Utica, N. Y., taking $300,000 of the capital stock, and residents of Flint, $100,000, divided among some twenty-five different people. The officers of the company will be: C. S. Mott, president; Hubert Dalton, vice-president; and William G. Doolittle, secretary and treasurer, all officers of the Weston-Mott Company, of Utica. C. S. Mott was elected general manager, and Hubert Dalton factory manager of the new company.

The new factory at Flint is nearly completed, and has floor space of three times the capacity of the Utica plant. Mr. Dalton will be located in Flint July 15, at which time the factory will be finished, and a large amount of machinery and material will be on the grounds. As soon as Mr. Dalton has installed, in productive condition, the large amount of new machinery that has been purchased, he will have sent to him from Utica the machinery from that plant in carload lots only, as fast as he can get it up and in operation. By this procedure it is figured that the output will at no time be less than the present, and should be considerably greater even during the moving period.

The Utica plant at present employs 300 men, and when the Flint plant receives all the machinery from Utica, it will employ 450 or 500, and will double the present output.

TRADE NEWS FROM THE TIRE CITY.

AKRON, O., June 25.—Application for the incorporation of the Williams Motor Carriage Company was made in South Dakota this week, the incorporators being H. A. Williams, Henry Robinson, J. F. Townsend, George W. Phillips, Ed. L. Grantham and Harvey Musser. The company will manufacture the new automobile designed by H. A. Williams, who has constructed a machine on entirely new lines, with the body suspended on the running gear on three points connected by socket and ball, the object being to have the body always horizontal. Speed levers and brakes are also eliminated in this car, the brakes are to be controlled by compressed air and solid tires will be used. It is expected to lease or erect a plant in this city for the manufacture of the machine. Some of the stockholders have large capital.

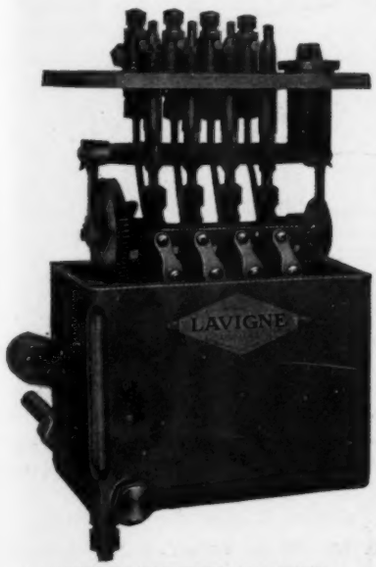
The Firestone Tire and Rubber Company of this city presents evidence that the Ford runabout is really and truly going to come out. This week it shipped its second solid carload of pneumatic mechanically fastened tires to the Ford Motor Company on an order received some time ago. The Firestone company is also doing considerable business in San Francisco, notwithstanding the earthquake, as it shipped a full carload of carriage tires to that city this week. Nearly all of the officials, office force and heads of departments of the Firestone Tire and Rubber Company enjoyed an outing at Silver Lake Thursday afternoon and evening, ending the festivities with a banquet. H. S. Firestone, the president and general manager of the company, was present and was the leader in all of the sports and fun of the occasion.

AUTO OUTING FOR BLIND BOYS.

BOSTON, June 25.—The annual automobile outing of the boys from the Perkins Institution for the Blind of South Boston, given by the Boston Automobile Dealers' Association, took place last Friday, and thirty-five youngsters who are sightless were given an all-day trip into the country. The association inaugurated this affair a year ago and the boys enjoyed the treat so much that it was determined to repeat the trip. An invitation was therefore extended to the orchestra of the institution and was immediately accepted. The boys were accompanied on the trip by ten leaders, so that a dozen cars were necessary.

A NEW MECHANICAL LUBRICATOR.

An interesting example of the tendency of makers of automobile accessories to perfect details with a view to securing efficient operation and accurate adjustment is shown in a mechanical lubricator made by the Lavigne Manufacturing Company, of Detroit, Mich. The oiler is of the gang-pump type and is driven by a worm and gear; all moving parts are positively operated. The main feature of novelty in the oiler is the method of adjusting the rate of feed. Each pump can be separately adjusted to any desired feed rate without in any way affecting the rate of feed of the other pumps. This is done by means of adjusting shells which screw down over the plungers and regulate the length of stroke. The shell and the rod passing up through it are graduated after the manner of a micrometer caliper, there being horizontal graduations marked on the rod and vertical graduations on the shell, the latter being compared with a vertical line on the rod. The diameter of the pump plunger is quarter of an inch and the full stroke five-sixteenths of an inch. The capacity per full stroke of one pump is .0153 of a cubic inch of oil; the stroke is divided into five parts by the horizontal graduations on the rod, and each of these five divisions is sub-divided into six by the vertical graduations on the shell, the full stroke being thus divided into thirty equal parts, each small division representing five ten-thousandths of a cubic inch of oil. By means of this arrangement the quantity of oil pumped can be adjusted exactly, and there is no difficulty in bringing back the adjustment to any given point after a change has been made. The rate of feed can be observed by means of bleeder valves attached to each feed. By pressing down a cap the oil is caused to pass through a sight drip; when the cap is released the oil returns to its regular channel.



LAVIGNE MECHANICAL OILER.

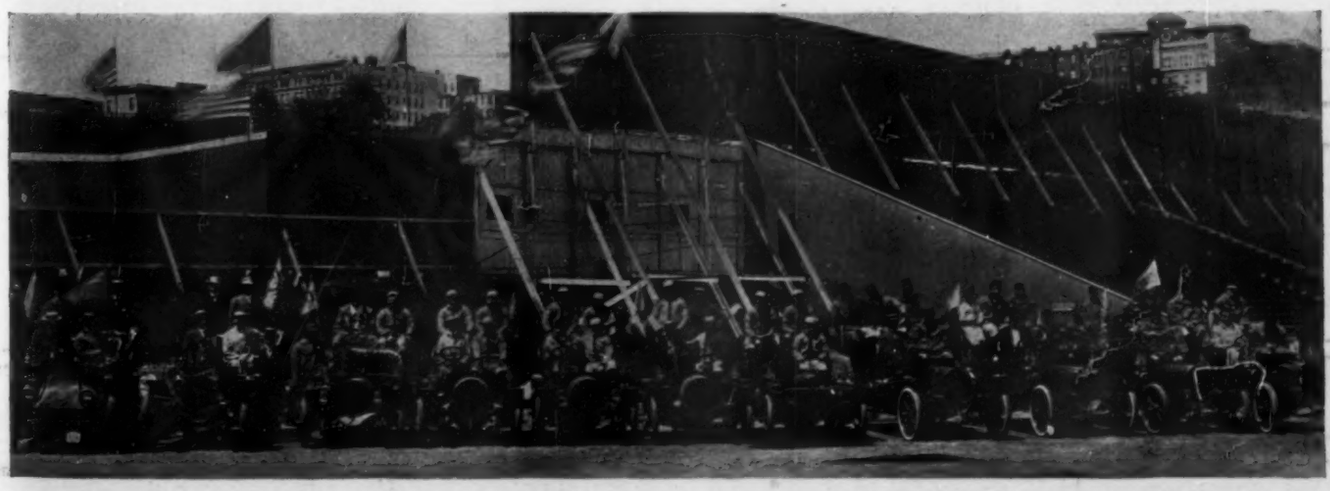
The lubricator is made in a number of different sizes and with any number of feeds from one to ten. The filling cap is fitted with a strainer, and the tank has a glass gauge.

A BASEBALL PARADE VIA AUTOMOBILE.

While stories are heard on every hand concerning the speed possibilities of the automobile, and, a little less frequently, of actual accomplishments, accounts of feats of the slow-speed variety are not often met with. It is a fact, however, that an automobile that cannot maintain a slow pace may sometimes find itself in quite as humiliating a position as the car that is enveloped in the dust of a faster rival. A public demonstration of the slow-moving qualities of fast automobiles was given at the recent parade of baseball clubs in New York city on the occasion of the raising of the championship pennant won by the New York team, the Giants, in 1905. Through the courtesy of C. F. Wyckoff and E. S. Partridge, respectively president and vice-president of the Decauville Automobile Company, of New York, sixteen cars—English Daimlers, C. G. V. S. and Franklins—were used to carry the victorious Giants through the city in the parade. The parade consisted largely of baseball men and boys on foot, every club within reach of New York that could muster up anything resembling uniforms being permitted to participate. The small boys' clubs were out in full force, and to their short legs was largely due the fact that the maximum speed of the parade was four miles an hour, and frequent stops were made for rest. So the cars had their work cut out for them, especially as the day was a warm one. But all got through without a hitch, the drivers squeezing their throttles down hard and watching carefully for the dreaded overheating of their cylinders. All arrived at the base-ball grounds in good condition, including the air-cooled cars, and then made the circuit of the field before 30,000 base-ball enthusiasts. The behavior of the cars under these conditions speaks well for modern cooling systems, whether using water or air.

RURAL DELIVERY TESTS VIA AUTOMOBILE.

WASHINGTON, D. C., June 23.—Information is given out by Fourth Assistant Postmaster-General DeGraw, who has charge of the rural free delivery service, that the Waltham Manufacturing Company, makers of the Orient, will shortly begin a series of tests to demonstrate whether or not a specially-built Orient can be successfully used in the rural free delivery service. The Postoffice Department has picked out a number of particularly hard routes in Maryland and Virginia for the trials, and they will be watched with interest by the postal authorities. The plan is to take the rural mail carriers over the selected routes in the car, which will be operated by one of the company's men. The carriers will make careful observations, which they will embody in a daily report to be submitted to Postmaster-General Cortelyou. In this way the department hopes to secure reliable data that will enable the postal authorities to lay before Congress the wisdom of appropriating a sufficient sum of money for automobiles for use in the service.



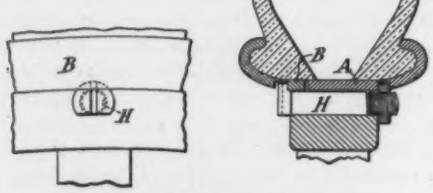
LINE OF FRANKLIN, DAIMLER AND C. G. V. CARS AT FINISH OF BASEBALL PARADE AT POLO GROUNDS, NEW YORK.

Patents

Rim for Detachable Tire.

No. 823,093.—H. B. Williams, of New York City.

This is a rim of the standard clincher section, but split into two portions, *A* and *B*, of which the latter is readily removable.



WILLIAMS DETACHABLE RIM.

It is held in place by the bolts *H*, whose heads have the special form shown in the drawings. When the tire is deflated the section *B* can be pushed back enough to release the bolt head, which is locked against turning when the rim is in the position shown. By giving the bolt a half turn the section may be slipped off.

Combined Spark Timer and Distributer.

No. 822,782.—J. M. Smith, of Philadelphia, Pa.

This is a device on conventional lines having the spark timer in the form of a metal barrel with inserted insulating segments and an external stationary brush or contact member. The secondary distributer is enclosed wholly in a hard rubber case, and has a spring contact finger rubbing against fixed contacting members in the inner periphery of the circular casing. The brush of the spark timer is mounted on the casing of the secondary distributer and is rotated with it to advance or retard the spark.

Searchlight Control for Automobiles.

No. 823,163.—J. S. Detrick, of Baltimore, Md.

This is an operating and controlling mechanism for the dashboard searchlight, and is operated by the foot resting on a special pedal. The pedal is pivoted to rock like a sewing machine treadle, and is also pivoted to turn to the right or the left. The former motion turns the searchlight up or down, and the latter acts through a sprocket chain connection to swing the searchlight from side to side. A pair of springs hold the searchlight normally horizontal and pointing straight forward.

Change-Speed Gear.

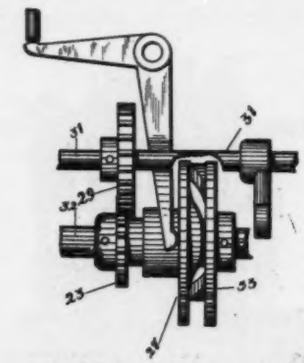
No. 823,369.—F. W. Schroeder, of London, England.

This is a change-speed gear comprising a number of beveled pinions on a sleeve slidable on the propeller shaft. The pinions are spaced so that one or another is in engagement with its corresponding bevel gear, the gears being concentric and attached to a single disk, which is retracted to allow the pinions to be shifted.

Valve Gear.

No. 823,347.—A. C. Menges, of Grand Rapids, Mich.

In the detail sketches shown *17* is the exhaust valve pushrod and *32* is the camshaft, on which the double-lobed face cam *33* is secured. A similar cam *28* acts against *33*, and is slidable lengthwise on the hub of the pinion *23*, which is loose on the shaft and is held in position by the gear *29* and rockshaft *31*. This rockshaft may be turned at the will of the operator, thereby changing the angular position of *28* on *32*, and correspondingly changing the timing of the exhaust valve. A sufficient rotation of *23* will cause the engine to reverse, and a smaller rotation will retard it. The inlet valves are automatic.

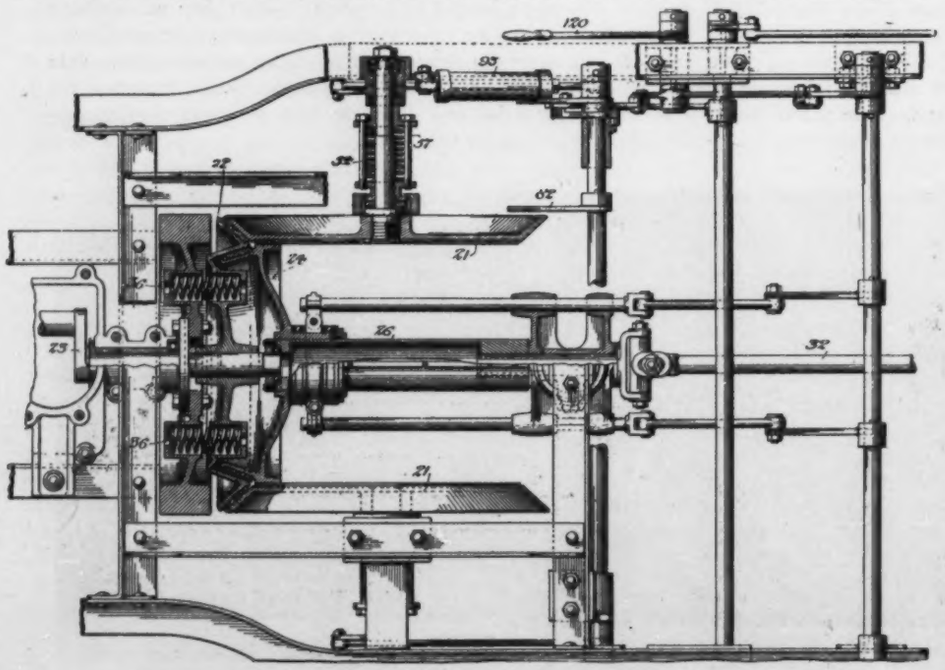


MENGES VALVE TIMING GEAR.

Friction Transmission System.

No. 823,178.—I. Larsen & R. Hardie, of Chicago, Ill.

The object of this system is to permit direct driving on the high speed with friction devices disconnected, and at the same time to employ the minimum number of frictional elements. This is accomplished by transmitting the power for the slower speeds through the beveled friction wheels *22*, *21* and the friction wheel *24*, which slides on the hollow shaft *26*, from which the power is communicated through a universal joint to the propeller shaft *32*. The friction wheel *22* is integral with a conical clutch member, and both are carried on pins projecting from the flywheel and are backed by the springs *36*. For the direct drive the clutch member on *24* engages that in *22*, and the springs *36* are slightly compressed, thereby releasing *22* from *21*. At the same time the disks *21* may be withdrawn from contact with *24*, by means of special mechanism operated by a foot pedal attached to *82*. The function of this mechanism is primarily to force *21* into contact with *24*, and it consists for each disk in a pair of spiral cams, one of which is backed by a stationary ball-thrust bearing, while the other presses against a thrust bearing which acts against the spring *54*. The partial rotation of the second cam against the first shifts it slightly along the shaft and compresses *54*. As *54* is already compressed by the bolts *57*, only a slight movement is required. A spring contained in the cylinder *93* tends to return the cams and disks to their non-working position. A pawl and ratchet hold the disks in engagement, and these are released by suitable connection with the brake mechanism.



LARSEN AND HARDIE'S FRICTION TRANSMISSION SYSTEM AND CLUTCH.

NEWS AND TRADE MISCELLANY.

The Northern Motor Car Company, of Detroit, states that a Northern car will be entered in the Glidden tour, but that the particular model has not been decided upon.

The Faulkner Mills Company, of New Bedford, Mass., has moved to 143 Summer street, Providence, R. I., and will continue its business under the name of the Providence Spark Coil Company, Ltd.

The Hollywood Automobile Company, of East Orange, N. J., is temporarily located at 118 Main street, pending the erection of their new concrete garage near by. This concern handles the Marion car.

A neat grain leather license case, for New Jersey licenses, has been brought out by the Hartford Suspension Company, of New York. A celluloid sheet permits the license to be seen without taking it out of the case.

The Northern Manufacturing Company, of Detroit, Mich., will on July 1 change its name to the Northern Motor Car Company, in order that it may be more closely associated with the automobile manufacturing business.

The Duquesne Construction Company, of Jamestown, N. Y., manufacturers of the Duquesne cars, have assigned. It is reported that the assignment is due mainly to the company's inability to secure sufficient capital to carry on the business.

Balkhan Schoyer, chief counsel for the Mexican Tramway Company, is spending two weeks at the plant of the H. H. Franklin Mfg. Co., Syracuse, N. Y., familiarizing himself with the construction of cars prior to an extended trip of Europe with a Type D.

Cable dispatches received by the White Sewing Machine Company, of Cleveland, O., report that a White steam car won the annual hill-climbing contest of the Midland Automobile Club, of Birmingham, England, defeating thirty-four competitors and making the best time by six seconds.

W. I. Fickling has purchased the entire interest of the Automobile Cover & Top Manufacturing Company, 154 East Fifty-seventh street, New York. The plant is being enlarged to accommodate painting and repair jobs on automobiles, together with all kinds of limousine, tonneau and automobile body work.

A regular meeting of the Buffalo Automobile Trade Association was held recently in the rooms of the Automobile Club of Buffalo. Much routine business was transacted and it was the sense of the meeting that the association should go to the Vanderbilt cup race in October in a body, in a special Pullman buffet car.

A new car will be put on the market next season by the Watson Machine Company, of Paterson, N. J., under the name of the Watson Conover car. The machine will have a motor of 35-40 horsepower, and will have a novel speed changing gear that is said to be very easy to operate. Hartford suspensions will be part of the regular equipment.

The New York Transportation Company has recently given its order for fifty Columbia electric landaulets similar to the Mark 67 type, to be added to its equipment of 600 other electric vehicles now used in New York City. The company is in the market also for five gasoline touring cars seating six or seven passengers besides the driver.

In last week's issue of THE AUTOMOBILE, in the report of the Washington automobile races held in that city June 16, the winning of two important racing events by Columbias was inadvertently omitted. Two of the most important races of the day—one for cars in the $4,500 class and the other for cars in the $3,000 class—were won by Columbias.

The Southern Automobile Company, of Nashville, Tenn., of which W. J. Cummins is president, has been sold to Duncan Kenner and Charles C. Codington for $50,000. Mr. Kenner has been elected president, Mr. Codington vice-president and general manager, and Charles Gilbert auditor. W. J. Cummins retains an interest in the company and was elected one of the directors.

Already the 1907 four-cylinder Cadillac touring car has been placed before the public, one of the new machines being on exhibition and in demonstration service in Chicago. The car is a 35-horsepower machine and has a planetary transmission. C. H. Foster, manager of the Chicago agency for the Cadillac, states that deliveries of the 1907 cars will be made in from thirty to sixty days.

Owing to the demand for tuition in automobile lore, the New York Y. M. C. A. automobile classes and the garage on West Sixty-fourth street will be kept open during the greater part of the present summer, probably until nearly the middle of August. The school is in a very flourishing condition, and similar work will be taken up by other branches of the Association that have not yet entered the automobile school field.

Among recent purchasers of Locomobile gasoline cars are M. L. Ryder, Albany, N. Y.; J. W. Dunn, president International Pump Co. (two cars), New York; John F. Havemeyer, president Concrete Steel Co., New York; Rev. D. C. Martin, Pittsburg, Pa.; Arthur S. Hamilton, Rochester, N. Y.; Nathan Meis, Cincinnati, O.; F. J. McCarthy, Denver Col.; F. L. Mercer, Chicago; Charles A. Niemeyer, St. Louis; Arthur P. Hawes, Boston.

O. S. Smith and wife left the Franklin factory at Syracuse on Saturday, June 16, in a new Type H six-cylinder, bound for their home in Denver. They expect to complete the trip July 1 and intend passing from Buffalo to Detroit through southern Michigan and into Chicago. After a few days' rest the trip is to be continued through Davenport and Des Moines, Iowa, Omaha, Nebraska, and along the line of the Union Pacific railroad to Denver.

It is reported that the Eastern District of the National Metal Trades' Association, which is composed of employers in the metal shop trades, is about to send organizers to the automobile factories in the Eastern states, with the object of enrolling them in the association. Nearly all the automobile firms in the West are already members of the national body. The National Metal Trades' Association is committed to the open-shop policy and its members employ about 130,000 machinists.

President Diaz, of Mexico, has purchased his first American car. Hitherto he has been a user of foreign-made cars, but lately gave an order for a Haynes to the agents of that company in the City of Mexico, the Central Automobile Company. The Haynes company is naturally well pleased with the order, and it came to them as a surprise. American tradesmen will be glad to note the fact that our products have received the stamp of official approval in our neighboring republic. Mexico has taken kindly to the automobile, its inhabitants being of a sport-loving disposition. Up to the present time there are no laws regulating speed there, and but few accidents reported.

It is reported that the Lozier Motor Company will move its automobile assembly department from Stamford, Conn., to Plattsburgh, N. Y., where the factory is located. Heretofore the parts have been made at the Plattsburgh works and shipped to Stamford to be set up. The company will continue the manufacture of marine engines at Plattsburgh, but will abandon the building of boat hulls, and will use the premises for the assembling department. It requires about four weeks to assemble the various parts of each car, and, as the company will have from twenty to thirty cars in the assembly department constantly, they will be able to turn out from five to eight each week when the plant is in full running order.

In a recent interview John L. Poole, of the Aerocar Company of Detroit, the well-known pioneer American automobile salesman to the foreign trade, is quoted as follows: "The Automobile Club of France sent two of the best French expert engineers to America this year, to especially study air-cooled construction. They examined all cars at the New York and Chicago shows, also visited all the leading factories, and their report, when turned in to the club, was extremely favorable to American cars in general, especially on account of their simplicity of construction, over that of European makers. Among the cars especially favorably mentioned was the Aerocar, which, in their opinion, outside of the motor, came nearer to European general construction than any other car made in this country. There is a great demand at present for the air-cooled car in Norway, Sweden, Denmark, Russia and Germany. Russia is a great field for the sale of automobiles and will be still greater when the present political disturbances have settled down to a solid basis. The air-cooled car to-day is not an experiment. It has been demonstrated under all manner of conditions and proved the fact that it does air cool under all conditions which may exist."

BLUE BOOKS TO CUSTOMERS.

The Matheson Company of New York presents to each purchaser of a Matheson automobile a copy of the "1906 Official Blue Book" with the following words printed in gold on the cover: "Compliments of the Matheson Company, New York." The book also has printed on its cover the name of the party to whom it is presented, and is enclosed in a very handsome box. The Matheson Company of New York states that the custom will be continued, but does not consider it a part of the equipment of Matheson cars. It is merely of a complimentary nature.

TRADE PUBLICATIONS.

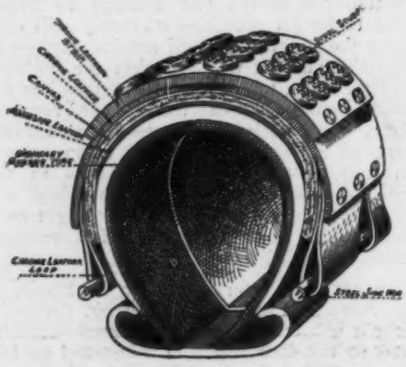
MICHELIN PRODUCTS SELLING CO., NEW YORK.—Circular regarding the merits of the Michelin pneumatic tire.

FORD MOTOR CO., DETROIT, MICH.—Instruction book for operating the Ford Model K six-cylinder car. An exceedingly practical little treatise.

MOTOR CAR EQUIPMENT CO., NEW YORK.—Very complete illustrated catalogue of automobile accessories and sundries, containing 128 pages of high-grade standard goods.

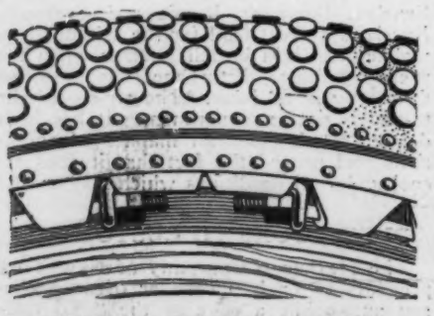
LATE SPECIALTIES OF THE TRADE.

LEATHER TIRE PROTECTOR.—A detachable leather tire protector and non-skidding band has been placed on the market by the Leather Tire Goods Company, of Newton Upper Falls, Mass., under the name of the Woodworth detachable tread. The accompanying illustrations show the tread so clearly that but little explanation is necessary. The band is held in position by steel wire rings



WOODWORTH DETACHABLE TREAD.

that pass through loops on each side of the tread. Two rings are used, one on each side, and each has a coupling where the ends join. The tread is applied without the rings, with the tire deflated. The rings are then passed through the loops and the coupling nuts screwed up and the tire inflated. The manufacturers state that the tread will not cause the tire to overheat because the steel rivets with which the tread is studded pass through and come into contact with the rubber and act as conductors for the heat; the rivets are said to have no in-



WOODWORTH TREAD RETAINING RING.

jurious effect on the surface of the tire, though severe tests have been imposed. Chrome tanned leather is used for the outer part of the tread, and a special friction leather for the inner layer. Between these are three strips of heavy canvas. The loops are also of chrome tanned leather, and, the makers state, are unaffected by water and will not stretch when wet.

NEW PORCELAIN PLUG.—Among the recent spark plugs that have been brought out with a view to improving that vital part of the equipment of the gasoline motor is the W. E. B. Sure-spark plug or Arc spark plug, illustrated herewith, manufactured by the Arc-Spark Manufacturing Company, of 125 West Thirty-second street, New York. This plug has a porcelain insulation of peculiar shape, as shown in the illustration. The surface is irregular, so that the distance that must be covered before a short-circuit is established is considerable. The rounded porcelain head projecting from the shell of the plug is exposed to the action of the gases in the cylinder, and the manufacturers state that any deposits of carbon made on this head will be blown off, so that the plug will remain clean under un-

SURE-SPARK PORCELAIN PLUG.

favorable conditions. The makers also call attention to the easy cleaning feature of this plug; all parts can be readily reached for this purpose. The porcelains are hand molded, and so fired, the makers state, as to leave them tough and not readily broken.

NEW DOW TIMER.—The timer illustrated here has recently been brought out by the Dow Portable Electric Company, of Braintree, Mass., and embodies several features of interest. One of the strong points of the timer is that the contacts are adjustable by means of small milled-head screws. As the illustration shows, the revolving arm on the shaft of the timer carries a small roller of hardened steel at its extremity. This roller makes successive contacts with as many flat steel springs as there are cylinders in the engine. The springs themselves do not form the contacts, but are pressed against the platinum tips of the adjusting screws through which the current passes to the binding posts on the outside of the timer case. Should the contact take place a little too early or a little too late in any cylinder or cylinders, the adjusting screws will remedy the defect and make the timing correct. Each screw is retained automatically in position by a spring catch which engages with the notches milled in the screw head. The shaft runs on double ball bearings adjustable for wear, and the instrument is dustproof.

PORTABLE ELECTRIC LIGHT.—A convenient portable light is manufactured by the American Endoscopic Company, of Providence, R. I., for automobilists and autoboatmen. The battery cells for the light are inclosed in a neat waterproof casing. Current is carried from the battery to the lamp by a flexible cable; the lamp is inclosed in a nickel-plated cylindrical metal casing with a bull's-eye lens. The outfit may be used, the manufacturers state, either for flash lightning or for continuous work.

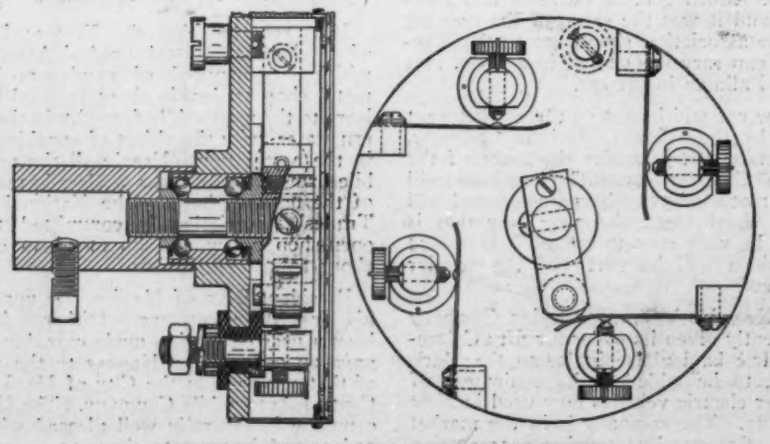
PERSONAL TRADE MENTION.

E. F. Thomas, son of E. R. Thomas, the automobile manufacturer of Buffalo, N. Y., sailed recently for Europe, accompanied by his bride.

H. A. Gillis, who has been superintendent of the American Locomotive Company's Richmond works for nine years, is to be general manager of the Autocar Company, of Ardmore, Pa., and will assume his new duties on July 1.

C. H. Ferrin, of Concord, N. H., a prominent New England automobile dealer and the Northern Motor Car Company's representative for Vermont and New Hampshire, is dead. Mr. Ferrin was an enthusiast and did much to advance the cause of automobiling.

Richard Pratt Marvin, secretary of the B. F. Goodrich Company, died on June 23, primarily from paralysis. He served as mayor of Akron, being elected in 1874 and 1878, and in 1880 he became secretary of the Goodrich company through his close friendship with Dr. B. F. Goodrich, the founder of the great rubber business in this city. Mr. Marvin was an attorney, having studied law in Jamestown, N. Y., where he was born, and while he was mayor he advised Dr. Goodrich in many matters concerning his experiments and patents. When the efforts of the founder of the Goodrich plant began to be rewarded, Mr. Marvin was offered an official position in the Goodrich company.



DOW TIMER WITH ADJUSTABLE CONTACT SCREWS.

CORNELL UNIVERSITY
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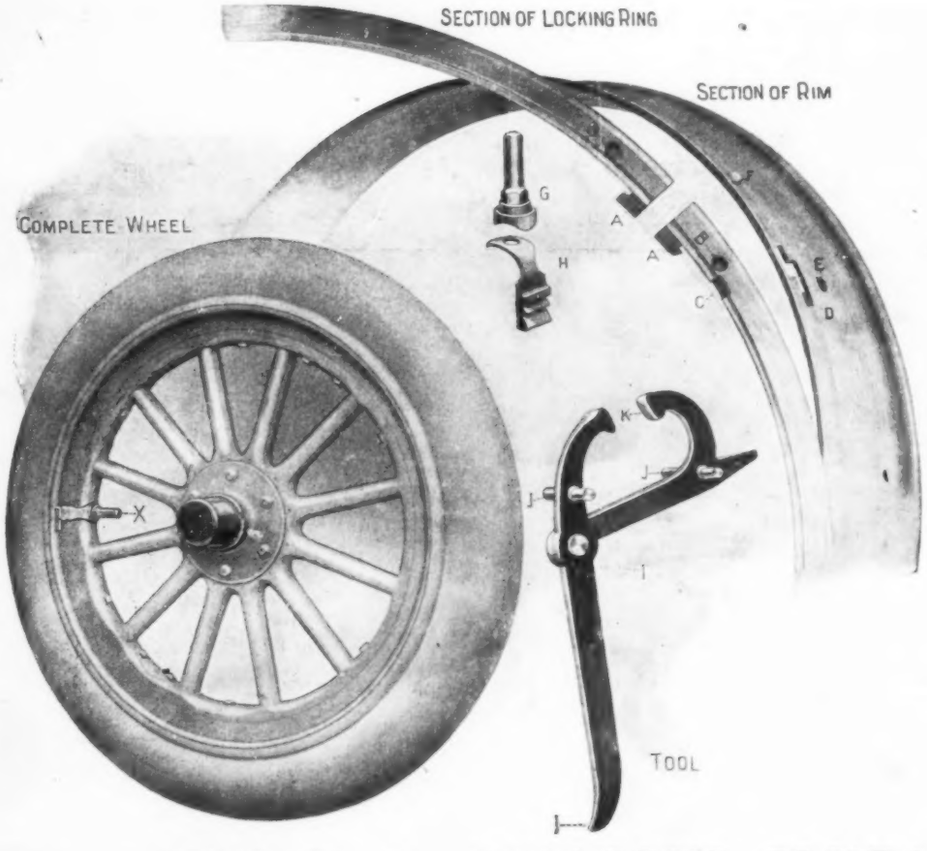
THE AUTOMOBILE

WEEKLY NEW YORK—THURSDAY, JANUARY 4 1906—CHICAGO 10 CENTS

Your Tire Off and On in Less Than a Minute

TELLS EXACTLY WHAT IS ACCOMPLISHED BY MEANS OF THE

Goodrich Quick Detachable Construction



and a visit to our Exhibit at the New York Automobile Show, Madison Square Garden, will afford you the opportunity to see our claims proved.

Perhaps you may wish to make dead sure and detach and attach the tire yourself. It is a pleasant little pastime with all the old-time hard-work features cut out. You will enjoy the experience and be impressed with the fact that the Goodrich Quick Detachable Tire and Rim is a great achievement in automobile tire building.

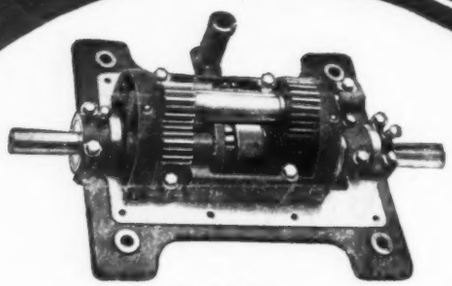
Space in Central Boxes directly over Madison Square Entrance

THE B. F. GOODRICH COMPANY

AKRON, OHIO

NEW YORK	66-68 Reade Street and 1625 Broadway	CLEVELAND	416 Erie Street
BUFFALO	731 Main Street	CHICAGO	141 Lake Street
SAN FRANCISCO	392 Mission Street	DETROIT	80 East Congress Street
BOSTON	161 Columbus Avenue	DENVER	1444 Curtis Street
PHILADELPHIA	909 Arch Street	LONDON, E. C.	7 Snow Hill

MARINE REVERSE GEARS

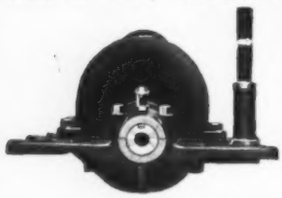


OPEN VIEW

WAS INSTALLED IN

SIMPLEX III, winner of the Long Distance Race from New York to Poughkeepsie, September 15, 1905.

WHITE FOX, winner in her class, at the Motor Boat Carnival, September 14, 1905.



END VIEW

COLUMBIA, winner of the third race for the Beebe Trophy, Connecticut River, Hartford, September 23, 1905.

PERFECT IN CONSTRUCTION

All working parts entirely covered. Require no attention. Can be thrown instantly from full speed forward into the reverse without injuring Gear or Motor. Both forward and reverse drives made through JOHNSON FRICTION CLUTCHES. Write for catalog.

Members of the National Association of Engine and Boat Manfrs.

We exhibit at the National Motor Boat and Sportsman's Show, Madison Square Garden, February 20-March 8th.

THE CARLYLE JOHNSON MACHINE CO. HARTFORD, CONN.

Automobile N.Y.

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"THE SIMPLE CAR"

Built by skilled workmen from the best materials obtainable. Elegant in finish. Luxurious in appointments.

The Simplest Gasoline Car in the world both as to Construction and Control and the easiest to operate and maintain. Not only eliminates many objectionable features common in automobile engineering, but possesses points of excellence not found on any other car.

Positively Self-Starting from the Seat every time. No cranking under any circumstances. 40-45 horsepower with Quinby Aluminum Tonneau, $5,000.

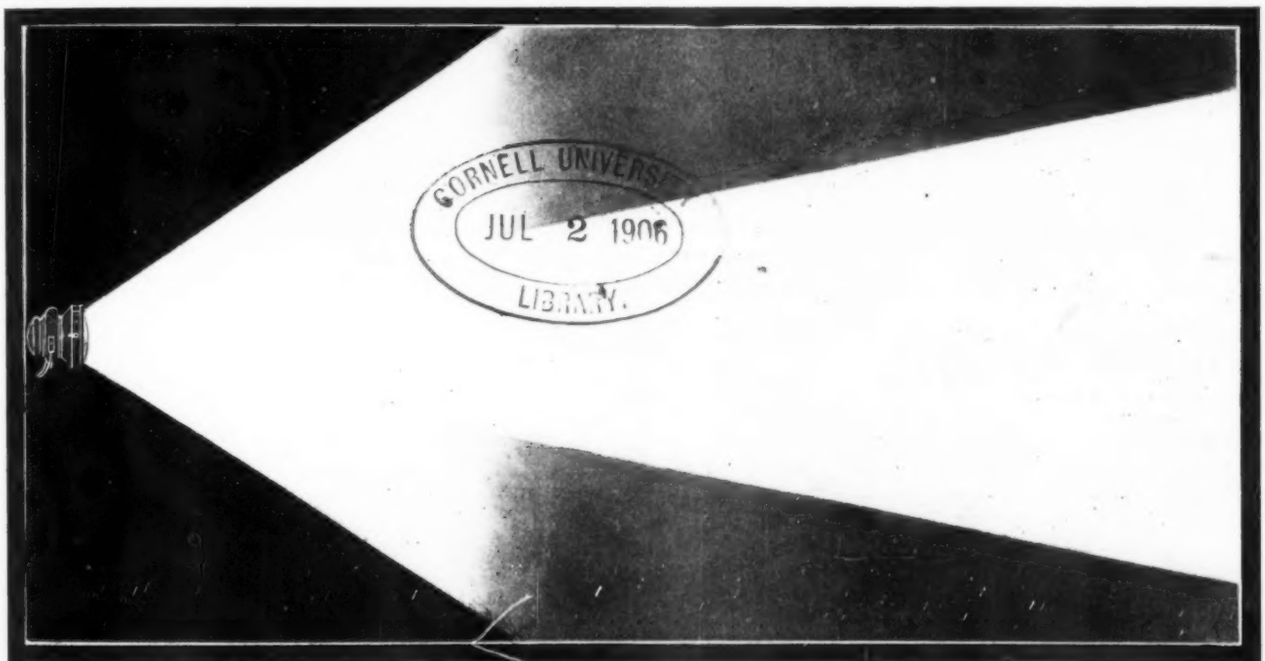
Limousine or Special Bodies to order.

"Marks a New Era in Automobile Construction"

CORWIN MANUFACTURING CO., Peabody, Mass., U. S. A.

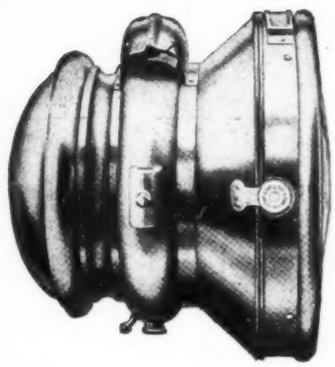
THE AUTOMOBILE

WEEKLY — NEW YORK—THURSDAY, JUNE 28, 1906—CHICAGO — 10 CENTS



CORNELL UNIVERSITY
JUL 2 1906
LIBRARY.

FROM PHOTO OF BEAM OF LIGHT FROM NO. 55 LAMP



GIVES MOST LIGHT—PROJECTS IT FURTHER

A little investigation of the light problem will establish the fact that our lamp, styles No. 50, No. 55 and No. 56, will satisfy those who want the very best lamp that money can buy.

As shown in the above illustration the back reflector is focused to give a "pencil" or long distance ray for showing the road far in advance, and the front reflector focused to give the "fan" ray and light up the immediate vicinity of the car.

It gives more light—gives a brighter light—projects it further—and is superior in every way.

Our firm policy in using the finest material, designed and manufactured under our personal supervision by skilled workmen in accordance with the best methods known in modern practice, and a reasonable price for our product, is the paramount factor in building **the largest lamp business in the world.** Our great factories have the largest output, our facilities are unlimited, and our promises of delivery dependable.

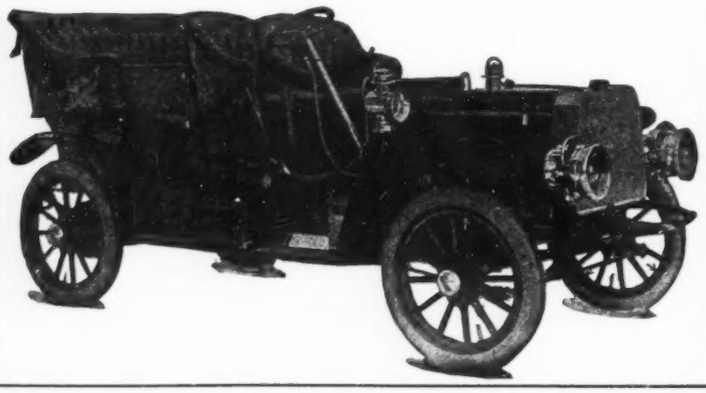
THESE ARE REASONS WHY

GRAY & DAVIS LAMPS

STANDARD OF THE WORLD

GRAY & DAVIS, AMESBURY, MASS.

The
Car of Quality
and
Simplicity



30-35 H.P.
$2,500

SOME CARS WILL BE AS GOOD AS

GROUT GASOLINE CARS

WHEN BUILT LIKE THEM, BUT NOT UNTIL.

Grout Brothers Automobile Co. Main Office and Works: **Orange, Mass., U.S.A.**

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MUNSING & CHAPMAN, 1855 Broadway, N. Y.
A. T. WILSON, 1558 Broadway, Denver, Colo.
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20th CENTURY MOTOR CAR CO., 1421 Michigan Ave., Chicago, Ill.
WHITNEY & CONVERSE, Winchendon, Mass.
J. A. PETREE, New Haven, Conn.
CURTIS, HAWKINS CO., Motor Mart, Boston, Mass.
H. K. DODGE, Glen Cove, N. Y.
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The Celebrated CHELSEA AUTO CLOCKS

The below in Round Cases.
2¾in. Auto Clock, $26.
3⅛in. " " 28.
3⅛in. Motor Clock, 24.

8 Day High Grade Clocks

"BEST in the WORLD"

Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest.

YOU OWN A GOOD MOTOR CAR?

BUY THE BEST CLOCK

The sizes are the approximate diameter of the dials. All are in Duplex (patent applied for) Cast Polished Brass Cases, the most thoroughly water-proof case on the market. The 2 3-4 in. "special" shows dial on an angle, and has locked case. The 3 1-2 in. "Motor" is a strong, reliable clock.

You want the Best? Ask for the "Chelsea."

2¾ in. "Special" Auto Clock. "Best in the World" $36.00

Chelsea Clock Co.
16 State Street, Boston.

Makers of Exclusively 8 Day High Grade SHIP'S BELL CLOCKS, MARINE CLOCKS AND AUTO CLOCKS.

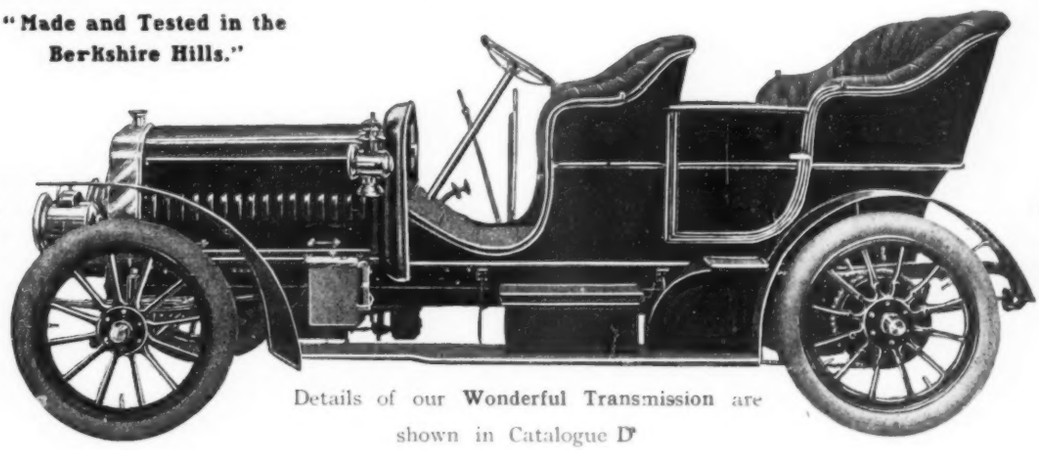
BERKSHIRE

HIGH CLASS

TOURING CARS

"Made and Tested in the Berkshire Hills."

24 H.P.
$2,500



35 H.P.
$3,000

Details of our **Wonderful Transmission** are shown in Catalogue D

BERKSHIRE AUTOMOBILE COMPANY

New York Agency, 1623 BROADWAY

General Offices and Factory: Pittsfield, Mass., U. S. A.

Boston Agency, 8 MOTOR MART

G & J Motor Car Tires

Made in the shape they assume in service, relieving strain on the fabric.

NO LOOSE COVERS

Fitted with a flap, giving a perfect seating for the inner tube.

NO PINCHED TUBES

Made with a raised tread, giving added wearing surface.

Rims branded in the channel with this Copyrighted mark have been inspected and pronounced perfect. We guarantee our tires only on rims so branded.

Why not buy THE BEST TIRES when they cost no more than others?

G & J TIRE CO.

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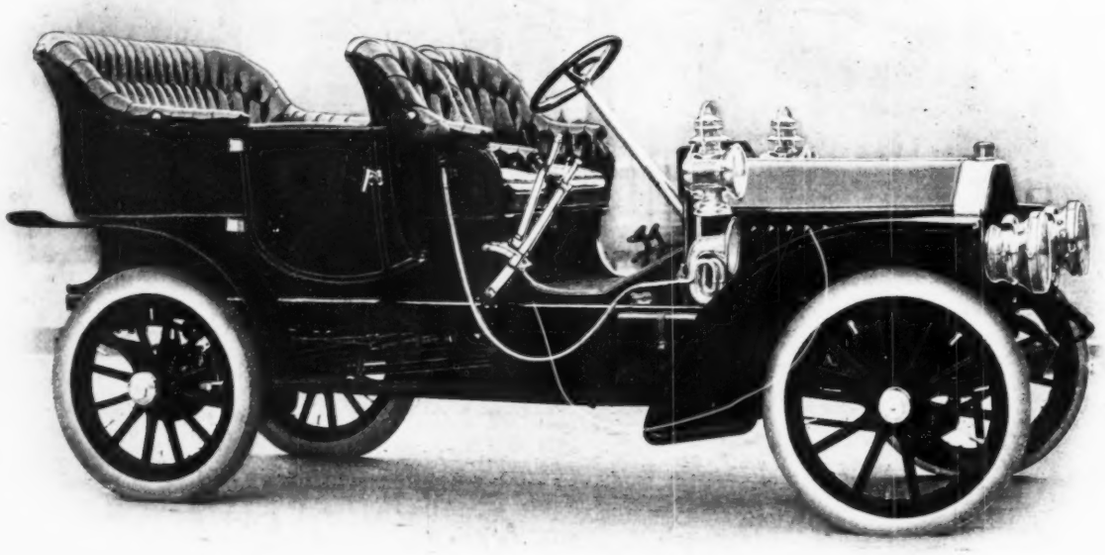
DEPOTS: Chicago, Detroit, Boston, Buffalo, Cleveland, Philadelphia, Denver, and 401 Twelfth Street, Oakland, Cal. New York, 10 W. 60th Street.

DISTRIBUTING AGENTS: Minneapolis, Plant Bros. Portland, Ore., Keats & Co. Los Angeles, Ramsay-Hutchins Rubber Co.

Peerless



An Echo from San Francisco

"I believe my Model 14 Peerless car is the best car the world can produce. During this terrible disaster that has overcome 'Frisco, the car has done more than its duty. In fact I believe it has been abused. Fifteen minutes after the earthquake on the morning of the 18th day of April my car went into service. *The first day it was driven 23 hours, second 22, third 21, fourth 19 and so on* until I had served my personal wants, the military, fire and police department, Red Cross Society, newspaper men, and many others. I was able to move between thirty-five and forty patients from my hospital to places of safety. My family was taken out of the city. Some of my valuable effects were saved. The car was loaded so that the body rested on the rear axle, the springs being of no use whatever. *From the 18th day of April at 5.30 in the morning until the 9th day of May my car has run 1876 miles without an adjustment or even a bath;* oil, gasoline and water being its only attention. I wish to again repeat that I cannot say too much for the Peerless thirty H.P. car and would not be surprised if it had a few spare horsepowers, as it has never faltered. I am more than pleased with it, and will give you an affidavit to the effect that everything I have said is correct."

From DR. HERZSTEIN, San Francisco

THE PEERLESS MOTOR CAR CO.

804 Quincy St., Cleveland, Ohio

Member A.L.A.M.